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## Management Appraises Direct Costing—A Play


by RALPH W. SAUBER

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THE SCENE:

*Five members of the executive committee of the Eclipse Company are seated about a table, with a vacant chair to the left. In the occupied chairs are the sales manager, treasurer, president, controller and production manager, respectively. All are reading copies of the company's income statement for the months of October and November (Exhibit 1).*

PRESIDENT:

The purpose of this meeting is to review the income statement for November. The results are not what I expected. I can't see why we should have a loss for November when our sales are up.

SALES MANAGER:

I don't get it either, unless costs were way out of line. We haven't changed sales prices and our sales mix was practically the same as in October.

PRODUCTION MANAGER:

Don't look at me. If you'll study your statement you notice that operating variances were up only $1,000. Believe me, with production cut to about half what it was in October, that's not bad.

CONTROLLER:

I think I can explain. The footnotes to the statement show what happened. The October profit was due largely to over-absorption of burden and the November loss to under-absorption due to low production volume. You see—

PRESIDENT:

Yes, I see that, but I'm not sure I understand it. Our fixed costs didn't increase did they?

**INCOME STATEMENT**

**October and November 1955**

**(Conventional Presentation)**

| | October | November |
|---|---|---|
| Net Sales | $950,000 | $1,000,000 |
| Standard Cost of Sales | 423,000 (1) | 620,000 (2) |
| Standard Gross Profit | $527,000 | $ 380,000 |
| Operating Variances | 2,500 | 3,500 |
| Gross Profit | $524,500 | $ 376,500 |
| All Other Expenses | 400,000 | 400,000 |
| Net Profit | $124,500 | ($ 23,500) |

(1) Standard Cost of 54%, less overabsorbed burden of $90,000

(2) Standard Cost of 55%, plus unabsorbed burden of $70,000.

**EXHIBIT 1**

**CONTROLLER:**

No, they were the same as in October, but the amount absorbed was different. You see, our standard burden rates are based on an estimated normal volume of production for the year. When we produce more than one-twelfth of that volume in any month, as in October, we over-absorb our burden. When we produce less than one-twelfth we under-absorb. Over-absorbtion is reflected in the October figures as a credit—a reduction in cost of sales. Under-absorption is shown in the November statement as a debit—an increase in the cost of sales. Is that clear?

**PRESIDENT:**

Well, er, let's see—Yes, yes, of course. (Turning to the Treasurer) You understand it don't you?

**TREASURER:**

I think so. Our standard burden rate is based on an estimated *annual* volume. Each month we charge the units produced at that rate. The amount charged —that is, absorbed—may be more or less than the actual burden. Our actual burden does not go up and down with volume because some of it is fixed.

**CONTROLLER:**

That's right. If the amount charged to products is more than actual, we over-absorb; if less, we under-absorb. We made a profit in October because high production resulted in over-absorption and—

**PRESIDENT:**

Wait a minute! Are you saying we made more money in October than in November because we produced more in October. If I—

**PRODUCTION MANAGER:**

Sure, that's what I've been telling you. We always make our best profits in months when we have high production.

**SALES MANAGER:**

Now, take it easy. Some of the units you produced in October were sold in November. Most of the rest are still in inventory. Do you mean to say that you can make a profit by manufacturing something—before you sell it?

**PRODUCTION MANAGER:**

Sure. Just look at the statements.

**SALES MANAGER:**

Hold it! Hold everything, Chief! I've got the answer. It's super colossal! We make money when we produce. We don't make money when we sell. So, all those salesmen I've got running around the country are wasting their time—right? Here's what we'll do. We make the salesmen quit selling. We bring them into the plant, put them on the production line, and produce like mad. And we'll all get rich—right?

**PRESIDENT:**

Please! Let's be serious. I know you are only being facetious, but your exaggerated illustration does seem to suggest that there's some fallacy in our method of accounting. . . .

Tell me, is it true that our accounting system shows higher profits with higher production, even when our sales don't go up?

**CONTROLLER:**

Well—I wouldn't put it exactly that way. It is true that profits are increased by overabsorbed burden when production is at more than average volume and decreased when volume is below average. But, in the course of a year, these monthly variations will tend to cancel out, and the amount absorbed during the year will be very close to the actual burden.

**PRESIDENT:**

But while we are waiting for the year end, we have to live with these fluctuating figures from month to month.

**CONTROLLER:**

Would it help if monthly cost of sales were shown at standard and the amount over and under absorbed shown below the line? Some companies follow that practice.

**TREASURER:**

It might help some, but it wouldn't change the wide fluctuations in monthly net profits figures. . . .

You should know, that, in a business like ours, where sales and production vary so much from month to month, it's darn important to know where we stand each month.

**SALES MANAGER:**

Say, isn't there *some* way that these absorption variances can be ironed out so that our reported profit will be more closely related to sales than production?

**TREASURER:**

Well—we might divide any overabsorbed burden between inventory and cost of sales on some logical basis.

**CONTROLLER:**

Or we might defer any overabsorbed balance and apply it in the month when the goods are sold.

**PRESIDENT:**

Perhaps either method would improve the figures somewhat. But aren't you just adding another complication to a method which is already too complex? Will it really solve the basic problem?

**TREASURER:**

Probably not. . . . Now, as I see it, the practice which distorts our monthly profit figures is the use of standard burden rates. Our burden includes fixed costs which don't vary much from month to month. But one month we produce more than we sell and, by using these standard burden rates, we charge more fixed cost to inventory than we transfer to cost of sales. The next month we do just the opposite.

**PRODUCTION MANAGER:**

Personally, I can't see that these standard burden rates are of any value for controlling factory costs. We get control through our departmental budgets. I'd like to see our accounting simplified so all of us can understand it.

**PRESIDENT:**

Exactly. Sometimes I feel that accountants spend too much time on accounting and not enough time on learning the needs of other management people. The rest of us have too much to do to spend time deciphering complicated accounting reports.

SALES MANAGER:

That's right. Some accountants carry a good thing too far. Like the one who was with me in the car the other day. We saw a flock of closely-cropped sheep. I said, "I see the farmer has sheared his sheep." You know what he said? "Well, it looks like it—on this side anyway."

PRESIDENT:

Accountants, I guess, are just naturally conservative, but I wish they understood our problems better. I'm sure we are all intelligent enough to read these statements and make due allowances for all these burden gyrations—if we had the time to spend on them. What I'd like to know is whether it's necessary. Isn't there some way that the accounting department can prepare simpler and more informative statements?

TREASURER:

This conversation has been very interesting because of what I have heard about another local company recently. Have you heard about the new system at Acme which simplifies reports? Jim Burns was telling me about it. He says that *their* executive committee can all get on the same wave length when they hold their monthly meetings.

PRESIDENT:

That's right! Sam Jones told me about it. He said he had the feeling that all of the board members understood the relationship between cost, volume, and profits after seeing their new type statement. He said it was like reading a break-even chart. What's it called?

CONTROLLER:

It's called direct costing.

SALES MANAGER:

Well, we need something that's more direct than what we've got. How does this direct costing differ from standard costs?

TREASURER:

I'd say it differs from standard cost only in the way factory burden is handled. Standard costs are fine for controlling direct material and labor. But I think the accountants went too far in applying standards to burden, particularly the fixed costs. Now the pendulum is swinging back.

PRODUCTION MANAGER:

Who's promoting direct costing—the public accountants?

**TREASURER:**

No, the public accountants are relatively disinterested because this new method deals with monthly reports for management rather than the annual published report. As near as I can learn, several companies have developed direct costing methods independently of each other. It seems to have developed out of the needs of the times.

**PRESIDENT:**

Isn't there some source from which we can obtain authoritative information on direct costing?

**TREASURER:**

The National Association of Cost Accountants seems to be the clearing house for ideas on the subject. They have published a number of articles—both pro and con—on direct costing in the *N.A.C.A. Bulletin* and have also issued a research report on the subject.

**PRESIDENT:**

One of our fellows showed me some of their research reports and they impressed me. Haven't we got some memberships in the local chapter?

**CONTROLLER:**

Our Cost Accountant, is a member. I've asked him to stand by in case we need him. Shall I call him in?

**PRESIDENT:**

Sure, let's see what we can find out.

(The Controller leaves the stage for a moment and re-appears accompanied by the Cost Accountant.)

**SALES MANAGER:**

This direct costing sounds good. Maybe it's what we're looking for.

**TREASURER:**

I wouldn't be surprised if it gave us all the answers.

**PRESIDENT (addressing the new arrival):**

We've just been talking about direct costing and wondering whether it had any application in our business. Are you familiar with it?

**COST ACCOUNTANT:**

Yes sir, I am. I've been doing considerable reading on direct costing since we had a session of our local N.A.C.A. chapter on it last year.

**SALES MANAGER:**

What do *you* think of it?

COST ACCOUNTANT:

I believe that, for our type of operations, it would be a real improvement.

CONTROLLER:

This is one subject on which we don't agree. I question whether direct costing will provide any information which cannot be obtained from our present cost system—by analysis.

TREASURER:

That may be true, but why should it be necessary to make an analysis to get the information which some other system will provide directly. Frankly, I'm intrigued by the direct cost approach, but I've heard that it's not acceptable for tax purposes.

COST ACCOUNTANT:

So far as I know there is no specific ruling on that point. The regulations do require that a consistent method of accounting be followed from year to year. Any change in the accounting system must be approved by the district director. Where the installation of direct costing results in a write-down of inventory values and a corresponding reduction in taxable income, approval would appear to be doubtful.

PRESIDENT:

How about our C.P.A.'s. Do you think they would approve an annual report based on direct costing?

COST ACCOUNTANT:

They might certify the report, but they would almost certainly feel obliged to take an exception to it in their certificate. . . .

Direct costing is new. It has not yet reached the status of a "generally accepted accounting practice" for public reporting. However, if a significant number of companies should adopt direct costing, it is possible that the public accounting profession would decide that it is a generally accepted practice.

PRODUCTION MANAGER:

Well, if you can't use direct costing for tax purposes or for published reports, why consider it?

CONTROLLER:

That's been my viewpoint right along.

TREASURER:

It's not my viewpoint. I can't see why tax and annual report considerations should keep us from having any form of reports we want for managing the business. Isn't it possible to use direct costing during the year and still make our annual reports on the conventional basis?

**COST ACCOUNTANT:**

Quite a number of companies do. The Revenue Service and the C.P.A.'s are interested only in our annual figures. It would not be difficult to adjust a year-end direct cost statement to meet their requirements. I assume your primary interest as members of the executive committee is in having meaningful and understandable reports monthly.

**PRESIDENT:**

That's right! That's what we've been talking about all afternoon. How would you calculate this year-end adjustment?

**COST ACCOUNTANT**

For us it would be rather simple. Since we absorb burden on a labor dollar basis, all that would be necessary would be to calculate the ratio of burden to labor for the year and apply this ratio to the labor content of our ending inventory.

**TREASURER:**

That sounds all right. But when you refer to burden you mean fixed burden, don't you?

**COST ACCOUNTANT:**

That's right, because I feel that we can eliminate variable burden as a separate classification.

**PRODUCTION MANAGER:**

What do you mean by "eliminate variable burden"?

**COST ACCOUNTANT:**

Our only significantly variable burden items are fringe benefits on direct labor and indirect material and supplies. We could increase our labor standards to include fringe benefits. At the same time, we could reclassify indirect materials and supplies as direct materials and include the cost in our material standards. None of the other burden items vary to any extent with production volume.

**SALES MANAGER:**

There's still one thing that bothers me. How are you going to make pricing decisions when you don't have a full product cost?

**TREASURER:**

I'd like to answer that one. We don't have a full product cost now—not in the costs we charge to inventories and cost of sales. Selling and administrative expenses aren't included. But you do have a full product cost on your cost cards because selling and administrative expenses have been applied statistically. Can't we do the same thing with fixed overhead?

COST ACCOUNTANT:

That's right. Your product cost cards show standard labor costs by departments. It would be as simple to apply the ratio of fixed burden to labor to these standard labor rates as it is to apply selling and administrative expenses.

PRESIDENT:

That seems to clear the air on pricing.

TREASURER:

We have several subsidiaries and divisions. I have heard that a direct costing system creates problems when you transfer materials between companies or divisions. Is that true?

COST ACCOUNTANT:

No, sir. The problem of pricing between affiliates is a complicated one under any cost system. But whether you apply direct costs, standard costs, or full cost, including administrative, etc., the basic problem remains unchanged. This is true regardless of how many companies or divisions a product passes through before it is sold on the outside market. In the case of subsidiaries, production is usually transferred at market price and the full purchase price is picked up as cost by the buying company. In the case of divisions, production may be transferred at market price, at standard cost, at direct cost, or for nothing at all, if management should so desire. The point is that this is a management decision. But, whether management decides to transfer at market price and gauge the efficiency of the division by profits or to transfer at direct cost and control burden by a budget, any good accountant should be able to adjust his system to reflect the true picture.

TREASURER:

Our Subsidiary "A" sells all of its production to the parent company at market price. If we use a direct cost system, won't that complicate the problem of eliminating inter-company sales and purchases for a consolidated statement?

COST ACCOUNTANT:

Not at all. Since each corporation is a separate legal entity, the sales of Subsidiary "A" would be considered material purchases of the parent. In a consolidating statement, the subsidiary's sales would be eliminated against the parent's purchases. This procedure would be exactly the same under any other cost system.

TREASURER:

How about the case in which a division (not a subsidiary) sells some of its production to outsiders and transfers some to the parent company? How would you adjust your records to reflect the true profit on the outside sales?

INCOME STATEMENT

October and November 1955

(Direct Cost Presentation)

| | October | | November | |
|---|---|---|---|---|
| | Amount | % of Sales | Amount | % of Sales |
| Net Sales | $950,000 | 100 | $1,000,000 | 100 |
| Standard Direct Cost of Sales | 323,000 | 34 | 350,000 | 35 |
| Standard Direct Cost Margin | $627,000 | 66 | $ 650,000 | 65 |
| Operating Variances | 2,500 | 0.3 | 3,500 | 0.35 |
| Direct Cost Margin | $624,500 | 65.7 | $ 646,500 | 64.65 |
| Fixed Factory Expense | 200,000 | | 200,000 | |
| All Other Expenses | 400,000 | | 400,000 | |
| Total Fixed Expense | $600,000 | | $ 600,000 | |
| Net Profit (Direct Costing) | $ 24,500 | | $ 46,500 | |

(The foregoing results, plus fixed costs added to inventory, less fixed costs removed from inventory reconcile to net profit on the conventional basis)

**EXHIBIT 2**

**COST ACCOUNTANT:**

Again, this is a problem under *any* cost system, but not a big one. In this case, direct cost would be applied to all sales, whether to outsiders or the parent company. Fixed burden would be allocated to all sales, for pricing purposes, on the basis of direct labor. The price at which outside sales are made would include enough mark-up over direct cost to overcome fixed burden and provide for a profit. If management policy calls for inter-division transfers at full factory cost, the price at which material was transferred to the parent would be at least high enough to recover, for the division, the pro-rata share of fixed burden, or to make a profit on these sales, too, if this is management's policy.

**TREASURER:**

Well, that is sound enough if you choose to measure the operation of the division separately. But suppose you are not interested in the division as a unit but want to assume that all items produced for the main plant are just transfers from one pocket into another?

**COST ACCOUNTANT:**

That is ever simpler. If management chooses to consider the division as nothing more than a manufacturing department of the main plant, then all transfers of production between departments are treated as inventory transfers at direct cost, and burden of the division is treated as departmental burden of the main plant.

**PRESIDENT (turning to Controller):**

You've been rather quiet. Do you still question this direct costing method?

CONTROLLER:

Yes, I do. And I'll continue to question is at long as it's not recognized as a generally accepted accounting practice. For one thing, I can't see that there is any difference between the wages of a man and the fixed costs of a machine which replaces him. They're both costs of the product.

TREASURER:

True, they're both costs, but there's a difference. Depreciation and fixed costs can't be varied with production as labor costs can. Your fixed costs can't be turned on and off. You're committed for them.

COST ACCOUNTANT:

That's right. Also, on the point raised, it seems to me that, when management substitutes a machine for hand labor, the accountant is reflecting a decision of management when he shifts the cost from the variable to the fixed category.

PRODUCTION MANAGER:

I don't follow you.

COST ACCOUNTANT:

When management commits itself to a fixed cost which goes on month after month, management is better informed if that fixed cost is charged off month by month. I believe this is better than dividing it into a variable portion—a standard—to be applied against income erratically depending on sales and production volume, and giving rise to an over or under absorbed portion which distorts the monthly profit picture.

PRESIDENT:

That's putting it in a nut shell. I'm glad to see that you have the management viewpoint. Well, gentlemen, we've covered the subject rather completely. Are we ready to make a decision?

SALES MANAGER:

I don't see why we shouldn't ask our Controller; with the help of our Cost Accountant, to make a study of direct costing as applied to our business. I'd like to see how our October and November statements would look on a direct costing basis.

COST ACCOUNTANT:

Just to see what the results would be, I've redrafted the October and November statements on a direct costing basis. If you would like to see—

PRESIDENT:

By all means. Do you have copies?

(The Cost Accountant distributes copies of Exhibit 2 to the others. They fall to studying it as he returns to his seat.)

**PRESIDENT:**

Well, that looks better. I may not be an accountant, but I know when we're making money and when we're not. This shows that our profits were better in November than in October.

**PRODUCTION MANAGER:**

What is this parenthetical notation you have at the bottom of the statement? Does it mean anything?

**COST ACCOUNTANT:**

I jotted it down in pencil to reconcile the net profit shown by direct costing with the net profit shown by the conventional statements. It got typed on by mistake.

**PRESIDENT:**

Do you suppose you could explain the difference to us? It might help us to understand the difference between the two methods.

**COST ACCOUNTANT:**

I'll try to. Let's look at October first. Perhaps you would like to put some of these figures down. Our fixed factory expense for October was $200,000, and that amount is shown on the statement you have before you as a direct charge against income. Now if you will refer to the conventional type statement, you will notice that using our present methods burden was over-absorbed by $90,000. In other words, compared with an actual fixed cost of $200,000, we charged to products—that is, to inventory—$290,000 to cover fixed costs. At the same time our sales of $950,000 were only 95 per cent of normal sales of $1,000,000 per month. As a result, the fixed costs transferred from inventory to cost of sales were 5 per cent below normal. Five per cent of our $200,000 fixed cost is $10,000. In other words, we charged to inventory $90,000 more than our monthly fixed costs and we took out of inventory $10,000 less than our monthly fixed cost. So during the month of October, we added to or deferred in inventories $100,000 of fixed cost.

**TREASURER:**

So, if you want to restate the profit you've calculated in the direct cost statement, you will have to write up your inventories by $100,000 and add this to your net profit?

**COST ACCOUNTANT:**

Exactly. But it can also work the other way. In November our sales were at the normal monthly rate, but our production was way down. Of the $200,000 of fixed expenses for the month $70,000 was unabsorbed. In other words, $70,000 more fixed cost was removed from inventory than was added

to it. So, if we want to restate our direct cost profit on a conventional basis, we have to reduce the inventory by $70,000 and deduct this from our direct cost profit. If you will do this on your statement, you will see that it converts a direct cost profit of $46,500 into a loss of $23,500.

SALES MANAGER:

Boy, how these accountants can figure. I'll go for this direct costing type of statement, but let's forget about this final adjustment. Once we've got it simple, let's keep it simple.

COST ACCOUNTANT:

The final adjustments are not essential parts of the statement for management purposes. However, it may be helpful to show them so that you can know each month the year to date profit which will be taxed and be shown on your published reports. Of course, by the end of the year, the debit and credit adjustment should pretty well cancel out.

PRESIDENT:

Now, young man, I have a few simple questions. Tell me—if we adopted this system, would our profit always fluctuate in relationship to sales rather than production?

COST ACCOUNTANT:

Yes, sir.

PRESIDENT:

Would our statements then show our direct costs in one place, our fixed costs in another place, and emphasize the cost-volume-profit relationship?

COST ACCOUNTANT:

They would.

PRESIDENT:

Would direct costing rid our monthly statements of all this complicated clap-trap of under and overabsorbed burden?

COST ACCOUNTANT:

That's right.

PRESIDENT:

Would the elimination of these burden standards and variance computations save work in our cost department and help produce monthly statements faster?

COST ACCOUNTANT:

Most certainly.

**PRESIDENT:**

Would we still have adequate control of our departmental burden expense, by use of budgets?

**COST ACCOUNTANT:**

That is true.

**PRESIDENT:**

Is it true that we could compute our sales break-even point, just from using the data shown on our statement of profit and loss?

**COST ACCOUNTANT:**

It becomes possible.

**PRESIDENT:**

As I see it, this new presentation could be a real help in communicating important information to management. Communication is an extremely important factor. To the extent that accountants *communicate* current data to management, they make a tremendous contribution to the efficient operation of a business. To the extent they fail to communicate, even though they compile figures and prepare statements, they fail of usefulness.

This has been very interesting and informative. I'm sure we want to follow it up. (He then addresses the Controller.) Do you suppose you could get Smith of our public accountants to come in and discuss this with us? Make it Thursday, if you can.

**CONTROLLER:**

I'll make the call right now before he leaves for the night. (Leaves stage.)

**COST ACCOUNTANT:**

Will that be all for me, sir?

**PRESIDENT:**

I guess this completes our meeting, but I'd like to talk with you a little further, young man—about your future in our company. Let's go into my office. (President and Cost Accountant go off platform together.)

# The Accountant's Place in the Control Function

by ALWYN M. HARTOGENSIS

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*The intimate connection of industrial accounting with the area of control of operations, which the accountant is clearly not commissioned to exercise but to which his activities are highly relevant, has been the source of much opportunity—used, unused and, occasionally, misused. Pictured in this article is the accountant's prominent part in construction, maintenance, and delivery of control tools and the partnership in management which this represents.*

HOW IMPORTANT IS THE FUNCTION of the industrial accountant to management control? If this is the significant question it is widely felt to be, perhaps we should ask also, what is meant by management control? Many accountants and many members of operating management from top down to first-line supervisors lack a clear, workable understanding of the answers to these two questions. An attempt at clarification seems to be justified. This attempt will be made here by means of an examination of the meaning and working of management control with reference to an industrial organization.

## *Management Control — and Its Reliance on Communication*

As soon as an organization outgrows direct oversight and management by its owner, responsibility for various functions must be delegated to subordinate managers and some form of accountability on the part of these subordinate managers must be provided. This delegation is a key development and it may be said that the first step in control is embodied in the means established to limit the authority of and to provide for accountability by subordinate members of management. But management control is not merely restraint. It has essential positive attributes. Control is the action taken to conform to an objective. Therefore, management control may be defined as the action taken to assure realization of and conformance with management policies, plans, and objectives, including such authorized changes as are necessary to meet new conditions.

So understood, control requires communication as a basis for understanding, decision, and action. The part of the accountant in connection with management control is largely in this area of providing communication. Formalized plans, accounts, records, and reports provide communication in form suitable

for controlling action: Hence management control may be particularized as requiring:

1. A means of communicating policies and general objectives and the assumptions on which the general objectives are based.
2. A means of reviewing and approving the proposed plans of subordinate levels of management to make sure of coordinated action to the desired end.
3. A means of measurement of results against the plan and the desired objectives, with provision for analysis of deviations from the plan.
4. A means of two-way communication for reporting variances from the plan and the reasons for such variances, in order to plan corrective action to be taken in such cases and to follow up to see that such action is taken and that it is effective.

### *Accounting and Nonaccounting Tools of Control*

The foregoing steps make effective management control possible, although they are not in themselves control. Nevertheless, it matters very much how fully these means to control are utilized. The conditions surrounding modern industry are such that really successful operation can be achieved only by policies and objectives which are explicit and embodied in comprehensive and orderly planning. Such plans, expressed in quantitive and usually financial terms, are termed a budget. The budget constitutes both a formulation of objectives and a means of communicating them. It is the basic tool for planning, coordination, and control. In its construction and administration, the accountant has a prominent —even prime—place.

However, control is not all in planning. It also is necessary to know currently how well operations are conforming to the plan and the reason and remedy for deviations from the plan in order that control may be maintained by corrective action. A budget alone will not do this. Accountability of each member of management is needed through a properly designed code of accounts and appropriate, analytic, and actionable reports. A code of accounts properly designed for purposes of planning and control provides segregation in terms of organizational responsibility, in order that there may be appropriate accountability by each member of management and segregation by major, significant kinds of revenues, costs, and expenses, in order that substantial variances may be analyzed readily for determination of significance, cause, and remedy. The code of accounts and the reports which it facilitates are, together with the budget, accounting tools of control.

There are at least three other tools of control with which the controller should be concerned, although, as a rule, he does not originate them. They are market research, work measurement or standards, and production scheduling. All are, or should be, positive and direct means of control. However, they are not as comprehensive as the budget and the control reports in reflecting them.

Adequate market research is essential to control of profit, control of both product development and sales effort, and control of sales volume. In many cases, market research is the soundest basis for a profitable pricing policy. It should guide product development into salable products and sales effort into productive markets. It provides a basis for good sales forecasts, with means for usable analysis of sales volume variances. Therefore, it is a most valuable instrument of control.

Work measurement, or standards, may not only be the basis of budgeted costs but they also constitute directly a most effective medium for control by first-line supervision. In this latter respect, control report data can be compiled and presented more promptly than can financial cost data and they can be applied more directly by the first-line supervisor.

Production scheduling is a planning operation usually performed independently of and without substantial direct assistance from the controller. It coordinates sales objectives and expectations, inventory policies, and production. Good production scheduling tends to conserve working capital and so to increase return on investment. It increases sales potentials by assuring customers of availability of product at earlier delivery dates. It provides for optimum use of equipment, tools, and men with consequent savings in manufacturing costs, as well as providing more stable employment. In the broader aspect of production control, it actually conforms production to the optimum plan.

### *Why Budgets Are Basic to Control*

The primary objective of management is to obtain long-range profitability of operations. This objective requires both long-range planning and short-range planning. The purpose of long-range planning is to establish policies, the management team, a skilled and loyal work-force, products and product quality standards, markets, sources of supply, reputation and public esteem, sound financial structure, and efficient and adequate facilities—all of which require time to build and long preparation to conserve. The purpose of short-range planning is to provide and coordinate a more explicit and detailed program of action suitable for present conditions. If the short-range plan is compatible with, and tends to further, the long-range objectives, the latter will be under control as the short-range objectives are achieved.

Plans which can successfully lead to the achievement of the primary objective of long-range profitability must be balanced. They must coordinate the many diverse activities involved in selecting or developing products, purchasing, manufacturing, packing and shipping, warehousing, and marketing, together with the problems of financing, collecting, and servicing. The coordination of

these many factors requires that the planning be thorough and systematic. It has already been indicated here that budgeting is basic to the planning process. A budget is a medium of systematic planning. Review of preliminary budgets provides a means for the coordination of plans. After coordination, approval of these budgets, constituting the authorization is the first step in control.

The next step in control is to make sure that operations conform, to the extent that circumstances will permit, with approved plans as set forth in the budget or with duly considered and approved revisions of it. This step becomes a part of budgeting through the reporting function. The approved budget and the control report based on the budget become the basis for management control.

The relationship of standards and budgets to each other and to control is worth attention. Both provide objectives to which operations can be controlled. A standard states that, if a certain product is made, so many pounds of raw materials will be required or, if a certain part is made, that so many minutes on a particular machine will be required for a certain operation involved or that an assembly requires so many of each of a number of parts and can be put together in so many minutes. A budget may provide a plan as to how many of what will be made and sold and may sum up the standards involved in terms of quantities of materials, hours of labor and machine time, dollars of expense, and the consequent costs, revenues, and profits.

Both the standard and the budget (whether or not the budget is based on standards) are useful for purposes of control. The budget is of much broader scope. Except for their use as building blocks for the budget, the usefulness of standards for control is limited almost to first-line supervision. Higher echelons of management require summarization. For this, the common denominator of dollar cost, provided by the budget, is necessary. In addition, where the standard will not be attained, budgetary provision for adjustment to the realization expected on standards is necessary for realistic planning and effective control.

### Where Internal Reports Fit Into the Control Picture

In the exercise of control, management must evaluate results. It is necessary for each member of management to know how satisfactory his operations are, and the operations of his subordinates. The management reports issued should serve as a medium of communication to provide the means for this evaluation. In order to be an effective medium for this purpose, they must be properly designed to supply the essential information and must be issued in time for action to be taken.

The only really effective basis for evaluation is the budget, representing the plans and objectives of management. Essential to evaluation is the comparison

of current results with some benchmark. Although this benchmark might be past performance or the performance of some other comparable department, plant, division, or company, such comparisons are merely better than nothing at all, because the standard of comparison, itself, is not evaluated. This month's results may be better than last month's, but was last month satisfactory? The comparison does not really tell how good this month's results could have been. A budget comparison does.

Also, approved budgets are the most practical media for coordinating individual factors such as prices, costs, sales, sales mix, inventory position, production volume, production timing, and cash position—all critical factors in the profit picture. No one of these stands alone, but each must be coordinated with the others. Variances from the approved budgets provide the evaluation of results most helpful to management control. A distinction should be made between the control uses of the budget as a plan and of budget reports. Control exercised through budget reports is *ex post facto* control and is not a substitute for prior control exercised in the approval of budgets and in the execution of budgeted plans in current operations. It is remedial action when remedy is necessary, which, if taken in time, can correct an undesirable trend. It is required because true control (planning and following of the plan) will never be perfect and because the report of current results is an important guide for future plans.

The scope, content, manner of presentation, and frequency of management reports deserves extremely careful consideration. The writer notes a chronic tendency to confuse what is merely reference data with key data essential for controlling current action. In addition, there is a tendency to neglect consideration of the entirely different needs of the different levels and functions of management. As an example, in one large, well-known company, the operating head received monthly a binder of current reports (about three weeks after the close of the month) containing nearly two hundred pages of data. When asked how much time he devoted each month to reading these reports, he said, "Not more than fifteen minutes!" Would it not have been more effective to prepare a one or two page summary of key items of vital interest to this executive?

On the other hand, a word of caution in carrying to extremes the principle of management by exception is in order. Under this principle, only items which are out of control and require corrective action would be reported or given emphasis, either in a separate report or by flagging in a more comprehensive report. However, consider the case in which a budget tolerance of plus or minus ten per cent is recognized. Let us assume that a major item showed the following percentage relationships to the budgeted figures for six consecutive months: 92%, 95%, 96%, 99%, 103%, 108%. Obviously, it is going out of control. Under

the principle of management by exception, this item would receive no attention until it exceeded 110 per cent of budget. Clearly it needs attention before it exceeds the accepted tolerance.

### One Head of the Accounting Function — Or Two?

During recent years some companies have placed the control function in the hands of a control officer, independent of and coordinate in authority with the chief accounting officer. The reason usually given for such action is that accountants have too narrow an outlook and are too engrossed in the details and techniques of bookkeeping to assist in the control function. This reasoning reflects the scarcity of broadly-trained accountants with management thinking and the failure of our educational institutions and industrial organizations in this respect.

It also reflects a situation in which industrial or management accounting is not placed on a level with public accounting. Frequently, when a new controller is needed for an organization, he is brought in from the field of public accounting. This may be proper in individual cases but, as a common practice, it bypasses the industrial field where many managerial qualities are developed. Intelligent, constructive assistance in connection with management requires some understanding of the principles of management and, also, although not necessarily the training of an engineer, at least a broad understanding of the entire business, including its marketing and manufacturing operations. Because of these requirements, the engineer who has had short courses in management, in accounting, and in budgetary control may be better qualified than the accountant whose background is largely in public accounting and auditing—and the accountant who has grown with his company and has broadened his training may be better-qualified than either.

Accounting, properly used, provides a systematic approach to planning and control. The account structure must serve the purposes of control, as well as its other purposes, if control is to be achieved. It would not seem to be in accordance with sound principles of organization for one executive to be responsible for the accounting and for a coordinate executive to be in need of the authority to dictate the structure of the code of accounts or the structure or timing of reports based on the accounts. To the writer, it seems that a controller should be both the control officer and the officer in charge of all accounting functions.

However, it is extremely urgent that the business schools of our educational institutions provide better training in management accounting and that some recognition or accreditation equivalent to the certified public accountant's degree

be available for those trained to become chief accounting officers of business enterprises. Until this can be accomplished, it is necessary for industry to expose its accountants to the required experience and perhaps to provide some training courses. Certainly, it is incumbent on industrial accountants to prepare themselves to assume their appropriate responsibilities in management.

### The Industrial Accountant as a Diplomat

It is appropriate to emphasize here that control is a function of line management, not of the controller or the accountant. Controllership is a staff function assisting line management by providing the means of control throughout the company. (The controller is responsible for direct control of accounting operations.) All levels of line management from the chief executive down to the first-line supervisors have responsibility for control within their respective areas. It is the accountant (which designation includes the controller and the budget director) who serves all these levels of line management. He provides top-management with means of evaluation of middle management and he provides the latter with means of evaluation of first-line supervision. Moreover, he provides first-line supervision with means of evaluation of the performance of its workers. He may and should interpret the results to each level.

This is where the accountant (using the title generically) gets into trouble. To each level of line management he is both staff assistant and interpreter. That is, in reporting to a foreman, he is a quasi-member of the foreman's staff but, in reporting and interpreting a report to the foreman's superintendent, he must interpret the report of the foreman's results. Obviously, a control report discloses poor performance, when such is the case, and continual poor performance implies an incompetent manager. The accountant and his reports receive blame for making line management "look bad" when its performance so indicates. To make sure that this impression is not conveyed on the basis of factors beyond the control of line supervision, the accountant or budget analyst should be aware of such considerations and should point them out before the supervisor is "called on the carpet." Also, when performance is good, the accountant should be as quick to point that out as he would be to "view with alarm" a bad situation.

Above all, in his control-related functions, the accountant must have all of the facts and have them right. He must have the objectivity to present them fully and impartially, with all pertinent qualifications. He must have the understanding and knowledge to win the confidence of his associates in line management. Finally, he must have the courage to absorb the resentment of those who feel that they are placed at a disadvantage by his reports.

### Not Exercise of Control But Partnership With Those Who Do

In summary, management control means the action taken by management to assure realization of and conformity with management policies, plans, and objectives. In an organization of any size, control is possible only when these are not only deliberately formulated but also communicated explicitly and comprehensively. This immediately expresses the need for means of communication in order to make the plans at all, to coordinate them towards attainment of the desired objectives, to measure results against the approved plan, and to analyze those results to the end that revision of plans, and timely and effective corrective action, is assured when necessary.

In this connection the accountant is to a great extent the originator, operator, and custodian of the various means of record and communication essential to control. His tools for this purpose include the accounts, the budget, and the internal or control reports. (In education, training, and accreditation, this field of management accounting has usually been neglected in favor of public accounting. Perhaps accountants in the industrial field should consider themselves as managers or students of management, specializing in accounting, rather than as accountants engaged in a particular industry.)

Because the function of the accountant with respect to management control involves both communication and interpretation and only a very fine line divides the latter from evaluation, the accountant's part in the control function is very delicate. Control is a responsibility of line management, but a competent, analytical control report from the accountant may make the required decision and action on the part of its recipient quite obvious. The accountant may then appear to be exercising control. This should never go beyond appearance. Control is an exclusive function of line management. The accountant does contribute to and facilitate control. Analysis of the requirements for effective control indicate clearly that these lie predominantly in his field. He may well remain content with this staff function, so essential to line action that the connection closely suggests that line and staff, working in this way, are virtually in partnership for the success of the enterprise.

# A Stairway to Budgetary Control

by M. K. EVANS

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*Although a system of budgetary control of operations must work smoothly, as though it were itself a well-oiled and operated machine, there need be no illusion about what is required to set up a budget which will be respected and used. As the present author indicates, such a project is one to plan and not to plunge into. The nine steps identified may well serve as checkpoints against which to compare the effectiveness of going systems.*

ALTHOUGH MUCH HAS BEEN published on the various techniques of budgetary control, little guidance has been given in the area of ways and means of installing controls or in revitalizing existing control systems. In this paper, it is my objective to suggest a plan for designing and installing a system of budgetary control, which could also be applied to revision of a previous system. This plan consists of nine basic steps. They are to:

1. Define the objective(s) of the installation.
2. Decide on a basic approach.
3. Analyze the situation, i.e., get the facts.
4. Design appropriate techniques and procedures.
5. Clarify line and staff responsibilities under the budget.
6. Plan the installation program.
7. Recruit and train personnel.
8. Measure and maintain the system.
9. Use the information produced.

## Define the Objective

Specifically, what is it that we want to accomplish through a system of budgetary control? The objective adopted in particular cases will depend, to a large extent, on the type of company, the type of organization, and the overall situation in which the company finds itself. The basic objective in a relatively small organization might be to permit the chief executive to delegate certain specific parts of his responsibilities but to retain the basic control decisions in his own hands. Or budgetary control might be undertaken for the primary purpose of cost reduction. This objective might lead to the establishment of budgets only on certain classes of operating costs and would also have a direct bearing upon the routines established for setting budget allowances. These objectives would represent limited applications.

In more recent years, budgetary control has developed techniques and procedures which make it applicable to a much broader range of objectives. In its broadest applications, the objective of budgetary control is two-fold: (1) to plan all phases of a company's financial operations so as to yield the maximum long term return on investment; (2) to *control* operations so that the plans are carried out and the benefits realized. Under this interpretation, budgetary control embraces not only the usual areas of operating cost and expense but covers also the planning of income and operating profit and the various asset items of the balance sheet which determine the amount of invested capital. It is to this broad definition of the objective of budgetary control that I intend to direct the remainder of this paper.

Whatever objective is decided upon, it should be adopted only after thorough discussion by the top management group of the company. It should be thoroughly understood by every member of top management and be clearly adopted by them as one of the basic objectives of the company. If this is done, the executive charged with the responsibility for implementing budgetary control will understand clearly what it is he is expected to do and can be assured of the active support of all members of top management.

## Decide on a Basic Approach

It now becomes important to work out in detail the principles which are to be followed in setting up the budgetary system. To some extent, these principles will be determined by the nature of the objective which has been established. Such questions as the following come up for consideration:

1. How far down in the organization is authority and responsibility for planning and control to be delegated?
2. To what extent are those responsible for control to participate in the determination of budget standards?
3. Are standards to be in the nature of ideal standards which can never be attained or are they to represent what can be attained or should be attained by efficient planning and control?
4. To what extent are budgets to be made permanent? Under what circumstances will revisions be permitted?
5. Is the budgeting process to be tied in with annual profit objectives?
6. Is there to be a relationship between budget performance and incentive compensation plans?

These are only a few of many fundamental questions which should be answered as part of the process of deciding upon the basic approach. It is extremely important that the human relations aspects of all controls be given thorough consideration. Several publications in recent months have been devoted to discussing the impact of budget and other controls on people and, from these studies, principles have been derived which, if followed, will help prevent

complete or partial failure of even the most brilliantly conceived plan. These principles become increasingly important as the size of the organization involved increases.

### *Analyze the Situation, i.e., — Get the Facts*

With objectives clearly defined and a basic approach decided upon, we are now ready to undertake the design of our budget system. If planning and control of the financial aspects of the business are to be an integral part of the management process, its objectives and techniques must have the wholehearted acceptance and approval of those who will have part in them. If this is not so, it is likely that the entire program will degenerate into a figure-making and record-keeping process which will be completely sterile in its contribution to management. One of the best ways to assure wholehearted acceptance is to permit the organization to take part in the design of a system. This participation will have two beneficial effects upon the program. First, it will help to clear the way for ultimate adoption of the specific procedures and routines decided upon. Secondly, it will provide a valuable check against the adoption and attempted installation of impractical, time-consuming, and wasteful procedures.

Those who have been given the responsibility for establishing and administering a program should undertake a series of personal interviews with as many operating department supervisors as is possible and practicable. These interviews should be carried out from the top down, that is, with the higher levels first, proceeding then to subordinates within the various units of the organization. During these interviews, it is desirable to discuss each individual's attitude toward cost control as one of his supervisory responsibilities. He should be asked to define clearly the costs which he feels he can or should control or those which have a direct bearing upon his responsibility for attaining results. He should be given an opportunity to discuss problems which he has or foresees in connection with his responsibilities for controls and any limitations upon his authority to take action. Finally, it is desirable to allow him to express his opinions as to the tools he needs to do a proper job of planning and controlling the elements under his responsibility.

In addition, it is very important that the company's chart of accounts be carefully analyzed to determine how well it fits the concept of reporting data by responsibility. In most cases, classifications set up for financial accounting purposes will not be adequate to serve the objective of classifying asset, income, and expense items according to responsibility for planning and control. It will almost certainly be found necessary to provide for further subdivision of account

numbers, regrouping of other accounts, or even possibly a redesign of the entire chart of accounts structure.

Although this process of analyzing the situation and of getting the facts pertinent to the establishment of controls may seem to be a long and time-consuming process, it will pay for itself many times over in later years. Such a careful investigation will reveal, almost certainly, needs for reorganization of some departments and clearer definitions of responsibility and authority in almost all departments. In addition, it will show up blind spots in the planning and control process, i.e., elements of asset, income, or expense which have gone uncontrolled or have received inadequate attention in the past. This careful analysis will also permit the establishment of a logical arrangement of control centers, which will be neither too broad for sufficiently detailed attention nor so narrow as to be expensive and cumbersome to operate.

### *Design Appropriate Techniques and Procedures*

Obviously, any budget director who has been given the responsibility for installing a system of control should familiarize himself, prior to undertaking any of the above steps, with the various techniques and procedures which have been developed in this field. Thoroughly versed in the state of the art as reflected in published materials and in practices of other companies and armed with the vast store of information pertinent to his own organization, the budget director is ready to design the appropriate techniques and procedures for his company.

In this task, the budget director will find it necessary to develop answers for several specific questions. First, what kind of budgets are required to meet the various aspects of the company's situation? Earliest attempts at budgetary controls found expression in what is now known as a fixed budget identified with a specific period of time. Many aspects of a business organization still lend themselves to the application of fixed budgeting in this manner. Budgeting for contributions, for capital facilities, for fundamental or basic long-term research projects, and other aspects of business is still done in terms of the appropriated amount for a certain period of time. However, many aspects of business will not hold still long enough for a fixed budget to remain applicable for any period of time.

This led to the development of the so-called variable budget technique which involves the establishment of budgets which increase or decrease with changes in the volume of business handled. Budgets of this type are tied to different indicators of volume such as sales, productive labor dollars, issues from inventory accounts, etc. Variable budgets which have been soundly established need not be

changed every time volume goes up or down. In this connection, under the broad definition of budgetary planning and control with which this article started, standard costs may be considered as one technique involved in the overall planning and control process. Such standards might be called directly variable budgets for direct labor and material.

The next question which logically should be answered is how should budget allowances be established? Several authors have done an excellent job of describing what I call the historical basis for developing budget allowances. In this process, records of past expenditures for specific classes of expense are analyzed and correlated to various possible indicators of volume of business handled. Through the use of correlation analysis charts, the volume indicator which best fits the type of expense in question can be determined and a formula derived for expressing the pattern of variability as volume changes. Although such budget determinations may be submitted to the department head for his approval, this process, fundamentally, calls for the establishment of budgets in the accounting office by statistical methods. It has the disadvantage, therefore, of not permitting full participation of the individual to be controlled. Some companies get around this difficulty by supplementing such statistical analyses by a process of negotiation between the budget staff representative and the supervisor involved.

This approach to establishing budgets, of course, makes no allowance for the fact that lack of control may have existed in various degrees in the past. Some authors advocate taking account of this factor by setting the approved budget standard a cut below the pattern indicated by actual history by an amount agreed upon. For example, the budget line might be set ten per cent under the average of past performance. In addition, however, it is probable that, due to lack of prompt attention to costs on the up or down swing, the slope of the curve developed from past history is apt to be more flat than is desirable. In other words, it reflects too high a level for fixed expenses. These difficulties led to the conclusion in fairly recent times that budget standards should be submitted to the same type of analysis as standards for direct labor. In other words, budgets should be based upon engineered standards rather than upon past history.

Under the engineered approach, responsibility for assisting operating personnel in the development of factory budgets is considered to be the function of the industrial engineering department. Budgets for various office operations are determined by the same basic industrial engineering approach but usually under the direction of office systems and procedures departments. Many new techniques for analyzing work flow, layout, work distribution, and work measurement have been devised and are being applied in many companies. This technique provides

a much sounder basis for the development of budget standards and takes out of the picture inefficiencies which have been allowed to express themselves in past performance figures.

There are several other questions related to budget system design. One is, what should be the basic design and structure of reports? This includes determination of what kind of information should be presented to each level of supervision, in what form and how frequently. Literature in the area has pointed to the fact that we tend to overwhelm operating people with a mass of detail which is useful only after extended analysis. It appears almost self-evident that reports for internal control purposes should be crisp and concise, pointing the finger quickly to areas which are out of control and which need attention by the executive involved. Under the so-called vertical concept of planning and control, reports to higher levels of supervision should be summarized in terms of the performance of individuals reporting directly to them. Reports which are merely informational in nature and which are not expected to result directly in action, should either be eliminated or separated from those which are designed to point the way to specific action.

Somewhat similarly, what procedures should be adopted for the development of sales forecasts? A sound forecast of sales volume by line of product for the coming period is the starting point for all systems of planning and control. Inadequate attention to the trend of sales resulting in the development of false information on such trends can lead to untold waste in planning for facilities, inventories, manpower, cash requirements, etc. Recognizing that sales forecasting is by no means a precise process, the budget director will nevertheless, want to take advantage of whatever techniques are available for developing a forecast and for translating it into plans for production and for inventory accumulation. He will also want to establish a plan for keeping the corporation's "ear to the ground" so that changes from the patterns which have been forecast may be quickly detected and translated into adjustments in the operating plan.

The budget director will also want to think out when and how will overall operating plans be summarized and reviewed? In most cases, a thorough system of budgetary planning and control calls for the development of annual objectives for return on investment. The process involved calls for the submission by the various operating units of initial proposals for budget allowances related to plans and programs of the department for the future. These proposals are then put together in terms of a complete operating statement for the year and a projection of the assets and liabilities which will be produced as a result of those operations. Top management takes a look at the projected financial results of the various functions, plans, and programs expressed in the operating budgets and

decides whether or not such a financial objective is adequate. After this review certain corrective action may be taken in advance of the beginning of the year to alter the plans of programs which have been reflected in the budgets. In my opinion, this planning process is at least half of the benefit to be obtained from a budgetary planning and control system.

A final question is, what steps are to be taken in the administration of budgetary controls once established? Obviously the establishment of budgets to reflect assigned functions and programs and plans is only half of the process. Management must continually watch performance against agreed-upon plans and objectives in order to determine what members of the organization are not carrying out the functions as assigned and to determine action which must be taken to compensate for changes in conditions which were not contemplated in the establishment of the original plan. Accordingly, the budget director will want to establish procedures for calling attention of operating personnel, through reports or special analyses, to matters which should be acted upon by line supervision. He will also want to provide for regular reviews of performance by operating department heads, not only to assist those who are having difficulty but to commend those who are doing an exceptional job.

### *Clarify Line and Staff Responsibilities Under the Budget*

No system works by itself. The budget director, in developing his system, should provide for a careful definition of the responsibilities of all the operating personnel who will be expected to live and operate under the budget program. Such definition of responsibility should include the procedure and schedule for developing budgeting proposals. Each person should clearly understand the kind of staff service which is provided for him by the industrial engineering department, office systems and procedures department, and/or the budget staff to assist him in the development of his budget proposal. He should also clearly understand his prerogatives as a department head in accepting or rejecting the recommendations of these staff services. The operating department head should also understand clearly when to request revisions in budget standards and how such requests should be submitted. In addition, he should know thoroughly what his responsibilities are in connection with the review of operating performance, either for his own department or for subordinates under his direction.

In many organizations this clarification of responsibility will not be accomplished purely by the development of written instructions or by telling each individual or group what their responsibilities are. In most organizations in which the growth of control devices has not matched the growth of the company

either in size or complexity, it will be found that many members of management do not conceive of cost planning and control as part of their assigned function. Yet the only way that control can be satisfactorily accomplished is for each operating executive to consider the cost of carrying out his assigned function at the same time as he considers the actions necessary to carry out that function.

The budget responsibilities of staff positions which share in administering the budget present a special problem. They are probably the most difficult and frustrating positions in the entire organization chart. A true staff man has no direct operating authority. He can not accomplish results by ending his directions on his particular area by the phrase "and that's an order." His effectiveness in the organization and the degree of authority which he exercises is built upon the rock of acceptance, voluntary acceptance, on the part of operating people, of his services. If this is not the case, then one of the most fundamental principles of good management is violated. The job description, therefore, of members of the budget staff, of the industrial engineering people involved in establishing budget standards, and those of office systems people would be replete with such terms as assist in, consult with, promote, advise, etc. Every member of one of these staff departments should clearly understand that having a good system and knowing how to operate it is only half the battle. He must be able to sell his wares to operating people.

### *Plan the Installation Program*

Let us assume at this point that all of the basic steps which have been discussed thus far have been thoroughly carried out. In other words, the basic objective of the program has been clearly defined, all aspects of the basic approach to the objective have been decided upon, the appropriate facts of the situation have been developed through a thorough discussion process with all affected members of management, techniques and procedures appropriate to the peculiarities of the organization involved have been developed, and responsibilities for operating and staff personnel have been decided upon and clearly defined on paper. We are now ready to install the program which has been designed.

It is strongly suggested that the installation process should begin by careful clearance of all phases of the recommended program with those members of the organization who participated in the analysis phase. It is further recommended that these clearances be undertaken from the bottom up, worked through the organization. Again, this is a time-consuming process and one may be inclined to decide that it is not worth the time involved. However, such a procedure has

a very definite set of advantages which can save many headaches at later stages of the game. First of all, it cements the feeling of participation which members of management have derived from having been consulted in the first place. It assures them that the first consultation was not merely a bow in the direction of participation. It also gives the operating man a chance to point out any impracticalities which may have crept into the procedure. Third, clearance from the bottom up, if done carefully, makes clearance at the top level almost a foregone conclusion. Being able to say that the recommendations included have been cleared with all lower levels of supervision will go a long way to assuring acceptance of the plan by higher levels of management.

Having cleared the recommendations and having had them accepted by management, we are now ready to establish a time schedule for the installation of the various phases of our plan. In developing this timetable it is important to undertake first things first. For example, the establishment of the basic budget structure, including the definition of control centers, should take place before attempting to install staff services and procedures for developing budget allowances. Further, excessive speed should be avoided. It is a natural tendency on the part of management, when a program which bears promise has been developed, to want to get it into effect as rapidly as possible. However, I have seen several soundly conceived programs fall by the wayside because installation was attempted too fast. It takes time to change people.

### *Recruit and Train Personnel*

It seems a rather obvious observation to point out that these various steps which I have outlined cannot be taken in strict chronological order. If we wait until we are completely ready to proceed with the installation of the new system and have not already recruited and trained personnel for it we will be faced with a long period of delay. The position of this step in the sequence, therefore, indicates when it should be completed rather than when it should be started. In recruiting personnel for budget administration, it is highly desirable that complete job descriptions be prepared and that the requirements for filling these positions be clearly defined. Such requirements include education, work experience, and characteristics and aptitudes. In setting up the requirements for positions in our budget organization at Westinghouse, we have concluded that the last mentioned of these is the most important. We feel that, if we have men with the proper characteristics and aptitudes, we can give them, in relatively brief time, the technical tools which they will need to carry out their jobs.

The personal characteristics which are desirable for the kind of work involved in a budget staff operation include a high degree of ability to work with other people, aptitude for self-expression both in writing and orally, persuasiveness and ability to sell, an alert mind which does not balk at the rigors of analytical processes, and a very large helping of determination and resistance to discouragement. These specifications are in keeping with the earlier statement that this kind of staff work is the most difficult and frustrating job in the organization chart. Technical requirements which might be attached to the job include training in accounting, industrial engineering, and general business administration.

Having recruited such individuals, either from within or without the organization, it then becomes important to train them thoroughly in the objectives of the program, the techniques which have been decided upon, and in basic principles of human relations in staff work. Such training might be carried out by participation in the installation program or, if the individuals involved are on hand early enough, participation in the entire analysis and design. If such training is not possible, then formal training programs and on-the-job experience and coaching become more important.

### *Measure and Maintain the System*

The job of the budget director does not end with the installation of his program. If he carries out his responsibilities completely, he will also undertake to measure continually the effectiveness of his program and to provide for maintaining it in the face of constantly changing business conditions. By asking himself the following questions and similar ones, the budget director can constantly measure his system and its effectiveness:

1. Do all echelons of management consider cost planning and control part of their job?
2. Does each member of management take an active part in planning and controlling the functions which have been assigned him?
3. Is there an absence of bickering or disputes over assigned responsibilities and authority?
4. Are crash programs designed to reduce costs, reduce inventories, increase sales, or with other similar objectives, relatively infrequent or even nonexistent?

Maintenance of the system includes the training of new personnel, both line and staff, who become involved in the budget process as normal organization turnover takes place. This training process is never ending. Budget system maintenance also involves the revision of procedures and policies as the organization changes. As one man put it recently, there is nothing so constant as change. It is unreasonable to expect that budgetary procedure (or any other procedure) can be frozen and expected to maintain their effectiveness over a period of time.

### Use the Information Produced

Broad application of budgetary controls, in the manner described in this paper, will yield a wealth of information which, properly interpreted and applied, can take much of the guesswork out of management. For example, the development of variable budget standards integrated into a complete profit and loss analysis can be translated into terms of profit graphs or breakeven charts. Management can be apprised of the effect of increases or decreases in volume upon profits, the effect of increases or decreases in selling prices on profits can be analyzed, and the profit effect of special sales program, facilities programs, cost reduction programs, etc. can be properly evaluated. In addition, the various factors affecting turnover of investment and the resultant return can be clearly isolated and set up as targets for improvement programs. Segregation of fixed and variable cost elements to product lines, along with allocation of assets employed to product groupings, can assist materially in isolating "weak sisters" from the real profit producers of the business.

These are only a few of the applications of information yielded by a soundly conceived budget program. Management badly needs the kind of advice which can be derived from a careful analysis of the cost characteristics of the business as shown up by the budget program. Needless to say, these answers are not self-evident. They must be developed through intelligent analysis by qualified personnel. Because of his involvement in the establishment of budget standards and in the correlation of budget information, the man who is in the best possible position to make such analyses and provide management with the advice it needs is the budget director and his staff.

It is certainly evident that each of the nine steps which have been discussed for the design or redesign of a system of budgetary planning, and control could be made the subject of a paper in itself. However, if this paper touching on all, opens up areas of further thought and investigation and outlines a logical general plan of attack, then its purpose has been accomplished. Above all, it must be understood that failures of budgetary installations, when they occur, should not be regarded as having been inevitable from the start but as occasioned by some lack in the installation, itself. Every one of the nine steps is essential. You cannot miss any of the steps in a staircase and negotiate the full flight successfully.

# Let's Have the Story—Quick!

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*Not just a quick closing (which can sometimes turn out to be over quick) but a well-prepared, well-scheduled, well-disciplined closing of cost and general records is recommended and described in this article, along with methods of reliably estimating results from initial key figures. The author, an experienced accountant and manager, has in mind throughout that the accountant need not fail to fulfill his function as reporter and editor, to bring the company's situation before management, promptly and succinctly.*

IN THE DRAMA OF BUSINESS management the accountant has a choice of roles. He may play the financial historian, assembling with care and deliberation all the minute details of operations and results and presenting them at his leisure in a monumental compilation of accounting facts. He may, on the other hand, cast himself as a news commentator, always first with the latest on how things are going, money-wise, and what can be expected to happen next. Should he attempt this latter task? How can he perform it successfully?

Where any individual accountant can fit most comfortably into management activities is a matter of opportunity, talent, and temperament. Some top executives have a distaste for accounting statements and financial advice. Some accountants have little capacity for quick analysis or astute forecasting. In most cases, however, the management will welcome, and the accountant can supply, a crisp up-to-the-minute summary of financial progress, which soon becomes the unquestioned source of information on what is happening and what should be done about it. The position this gives the accountant is too attractive not to be sought with all the ability at his command.

The problems are: (1) what accounting facts will be useful and (2) how can they be assembled and presented quickly. The latter problem is the subject of this paper. It will be assumed that the facts wanted are all particulars of production, shipments, and inventories; revenues, costs, and expenses; yields and variances; turnover, margins, and earnings rates; changes in financial position; and prospective results for the near-term future—in other words, the whole content of a comprehensive financial report, condensed into a thumb-nail sketch which can be prepared in a matter of hours and presented in a matter of minutes. This is the task.

### How Soon Is Soon Enough?

To establish the accountant's report as the first work on results of operations, how quickly must he get it ready? If he is to anticipate the conclusions of an alert and informed general manager, the accountant will find he has almost no time at all in which to reach and express his own conclusions. The top executive who is on top of his job knows pretty much what is going on—whether the business is making or losing money—before anyone comes in to tell him about it. He soon develops short-cut methods of estimating profits, which tell him about what to expect when the bookkeeping is finished. To compete with this approach, the accountant must have short-cut procedures of his own—faster, better, more specific and reliable.

The manager characteristically wants to know currently—from day to day—how much product is being made and how much shipped. At the end of a month he wants to know right away—on the first day after closing—how much profit has been earned and what has happened to cash, receivables, and inventories. And within a few days thereafter—a week or so at most—he should have all details of past occurrences for review with his sub-executives, to locate favorable and unfavorable trends, take corrective measures, make new plans. After a couple of weeks, past history has lost its interest for everyone but the historian-accountant. Today's events are of more concern than the half-forgotten occurrences of four to six weeks ago.

The reporter-accountant, then, might well make himself responsible for furnishing top management with accounting statements and reports on some such schedule as the following:

1. Daily (next following day) with current and cumulative data on such "key" factors as employment, production, sales, probable earnings, and cash flow.
2. Monthly (first day after closing) with preliminary figures on earnings and financial position (condensed income statement and balance sheet), with projection of expected results for next following month.
3. Monthly (by end of first week after closing) with complete reports on revenues, costs, expenses, variances, budget comparisons, inventory schedules, property account details, etc.

This paper will describe a program developed to meet these requirements in a company with which the writer is well acquainted. This concern produces synthetic textile fibers. It operates two manufacturing plants, a large research center, a branch warehouse, and several sales offices. It employs close to 5,000 people, and has a multi-million dollar volume and investment. In this company, keeping the management promptly and fully informed on all financial developments has been a challenging task. Experience has demonstrated that the job can be done

and that it is not unduly burdensome. The essentials of success are ingenuity, forethought, and close application. The penalties in stress and strain are counterbalanced by the gratification of achievement and recognition.

## Choice of Methods

In the march toward the goal of prompt reporting, two distinct avenues of approach are always open. One is the use of ordinary bookkeeping techniques, strongly accelerated by every practical means. The other is the development of independent measures of operating results, providing close estimates of important profit factors, subject to later verification when "book" figures become available. Both lines of attack on the problem can be advantageously employed.

Double-entry bookkeeping is a beautiful technique, and its intrinsic merits can hardly be over-emphasized. It imposes one handicap on the news reporter: in a complex operation its processes tend to be somewhat slow and a little cumbersome. For a final proof of the mathematical accuracy of the integrated statements it has no peer, but for quick summation of overall results it is not so well adapted. Fortunately there are other means of evaluating results, and the reporter-accountant will find it necessary to use them.

First attention, however, may well be given to the problem of speeding up the month-end bookkeeping. A leisurely closing procedure, with which many concerns seem contented, gets the work done sometime after the middle of the following month. Completion on the "tenth working day" is considered quick work and final reporting by the "third week" nothing that calls for apology.

In the subject company it was decided that standards like these were far too liberal to be either defensible or practical. From the beginning of its operations the standard "closing date" was gradually crowded back, a day at a time, till now it has been established at the *fifth* working day after the closing date. The program calls for completion, by that time, of all entries, postings, and account balancing, and preparation of at least the master copies of all statements, tables, and analyses which make up the monthly financial summaries (some textual comment may not be finished till the following day).

When it is appreciated that this involves not merely the fundamental bookkeeping work but also the development of 22 general financial statements, more than 150 departmental cost statements, and 15 or 20 related statistical summaries (listed for illustration in Exhibit 1), plus the concurrent review of this material by several dozen area supervisors and department heads *before issuance*, the exacting demands of the program will be apparent. What steps are necessary to carry it out?

LIST OF STATEMENTS AND REPORTS

| Financial Statements | | Operating Statements | | |
|---|---|---|---|---|
| Table | Contents | Table | Content | Cost Reports |
| 1 | General Income Statement | 31 | Plant A - Chemical Production | 20 |
| 2 | Plant A - Revenues and Costs | 32 | " " - Yarn Production | 14 |
| 3 | " " - Margins by Products | 33 | " " - Utilities | 17 |
| 4 | " " - Variance Analysis | 34 | " " - Services | 16 |
| 5 | Plant B - Revenues & Costs | 35 | " " - Maintenance | 8 |
| 6 | " " - Variance Analysis | 36 | " " - Purch. & Inv. Vars. | - |
| 7 | Overhead Expenses | | Statistical Analyses | 8 |
| 8 | Financing Expenses | | | 83 |
| 11 | Comparative Balance Sheets | 41 | Plant B - Fiber Production | 7 |
| 12 | Investment by Product Groups | 42 | | |
| 13 | Cash Resources | 43 | " " - Utilities | 9 |
| 14 | Accounts Receivable | 44 | " " - Services | 17 |
| 15 | Plant A - Product Inventories | 45 | " " - Maintenance | 6 |
| 16 | " " - Inventory Movement | 46 | " " - Purch. & Inv. Vars. | - |
| 17 | " " - Operating Supplies | | Statistical Analyses | 4 |
| 18 | Plant B - Product Inventories | | | 43 |
| 19 | " " - Inventory Movement | | | |
| 20 | " " - Operating Supplies | | | |
| 21 | Property Costs and Book Values | 51 | Overhead - Research | 12 |
| 22 | Property Costs by Location & Function | 52 | " - Administration | 13 |
| 23 | Construction in Progress - General | 53 | " - Marketing | 15 |
| 24 | " " " - Special | | | 40 |

Notes

Number of financial & operating statements, 36; number of cost & statistical reports, 166. Consolidated statements (Tables 1, 11, and 12) not completed until Monday second week, all others Thursday or Friday first week.

**EXHIBIT 1**

## *Fiscal Periods and Cut-off Dates*

The first observation of an accountant committed to this task is that the conventional calendar is very ill-adapted to his purposes. Months are not only of varying lengths, including different numbers of working days, but they end at random on every possible day of the week, without logic or pattern. Since efficient period-closing procedures must be carefully integrated with inescapable regular weekly tasks (e.g. pay roll preparation), the whole effort becomes intolerably complicated and confused if week-ends and month-ends have no predictable relationship.

The simple solution is to adopt, for accounting purposes, a "fiscal month", consisting of a specified number of whole weeks and thus ending always on the same day of the week. Such fiscal months can be uniform four-week periods (13 to the year, all of equal length), or a series of periods consisting, in turn, of 4, 4, and 5 weeks (producing four 13-week quarters and maintaining a rough cor-

respondence between fiscal periods and calendar months). The latter alternative was chosen in this company. Either is satisfactory for quick-closing purposes.

The next step is the selection of "cut-off" dates at or near the end of each period, for such basic factors as sales, production, pay rolls, etc. In the case under consideration it was decided to accumulate sales up to Friday night (normally no shipping on Saturday or Sunday) and production and pay rolls up to Sunday midnight (plants operate around the clock, 365 days a year). Billings are finished before work stops Friday evening, and summarized either that evening or the following day. Production data are assembled Monday morning, and pay rolls are completed (and distributed) Tuesday evening. These times fix the schedule for the remaining work.

Because bookkeeping necessarily concerns itself with details as well as essentials, the next step is to program the summarization of data having greatest volume and variety so that it will not hold up processing of entries and reports. Summarization of vouchers payable, labor time tickets, and stores requisitions, should be completed at the earliest possible date—preferably before the end of the period. In this company it was concluded that the validity of the statements would not be impaired if vouchering was stopped on Thursday evening, and distribution of stores requisitions and maintenance labor time tickets was concluded at the same time (with the Friday charges carried as "undistributed maintenance" until the following month). In this way all distributions except production, inventories, and pay rolls are ready for use the first thing Monday morning, with the entire week then free for completing the cost reports and financial statements.

### *Work Assignments and Time Schedules*

Inasmuch as the statements prepared embody upwards of 30,000 individual items and involve perhaps 10,000 separate computations (in addition to the background recordings and calculations on which the statements rest), it is obviously necessary that the work be subdivided into as many segments as practical, so that many people can be engaged on it simultaneously. A brief description of the accounting organization and its functions may be helpful to an understanding of how this is done (a list of the statements issued was given in Exhibit 1 and a sample cost report form is illustrated in Exhibit 2).

Work assignments parallel the subdivisions of the operating accounts. The primary break-down is into three groups—a "gross margin" section for each of the two manufacturing and selling units (under the respective plant accountants) and an "overhead expense" section for research, administrative, marketing, and

COST AND VARIANCE REPORT

Output (Unit _____)
Standard _____
Actual _____

_____ 19 _____

Center No. _____
Name _____
Plant _____

| Unit Cost Std. | Unit Cost Act. | Materials | Cost Standard | Cost Allowed | Cost Actual | Variance Efficiency | Variance Other |
|---|---|---|---|---|---|---|---|
| $ | $ | | $ | $ | $ | $ | $ |
| | | Labor & Supplies | | | | | |
| $ | $ | | $ | $ | $ | $ | $ |
| | | Utilities | | | | | |
| $ | $ | | $ | $ | $ | $ | $ |
| | | Services | | | | | |
| $ | $ | | $ | $ | $ | $ | $ |
| | | Occupancy | | | | | |
| $ | $ | | $ | $ | $ | $ | $ |
| $ | $ | Total | $ | $ | $ | $ | $ |

| Investment | M & E | Bldgs. | Total |
|---|---|---|---|
| Original cost | $ | $ | $ |
| Deprec. reserve | | | |
| Net book value | | | |

| Employees | Bud. | Act. |
|---|---|---|
| Wage | | |
| Salary | | |
| Total | | |

**EXHIBIT 2**

financing expenses (under a head office staff accountant). Each plant, in turn, is subdivided into segments for reporting (a) product sales, costs and margins, and (b) costs and variances for production, utilities, services, and maintenance activities. Each segment balances out its detailed reports against its own control account, and the results for each cost center group are reported separately by the area accountant to the area supervisor, independent of what goes on elsewhere.

Monday morning the cost men responsible for records of production activities start work on production and inventory data—assigning values to inventories of work in process and intermediate products, reconciling book and physical inventory data, calculating materials consumption and yields, figuring output rates, etc. Two days are allowed for this work. Cumulative data have previously been subtotaled up to the end of the preceding week, so that only the week-end production must be added. Book inventory figures are used wherever available, with most physical checks on a "cycle" basis at times other than the month-end.

Meantime, the cost men responsible for records of utilities and services are preparing inter-center "charge distributions," to provide the production cost men with the amounts which their activities must absorb for such items as steam, electricity, water, laboratory service, clean-up, supervision, etc. Cost standards have been established for each service unit, and inter-center charges are set up on this basis. Thus the distribution can be made before the actual cost for the individual center has been computed. Care is taken, however, to adopt a close-out sequence which facilitates compiling actual costs with a minimum of delay. For example, maintenance is first distributed to all centers, utilities to all centers except maintenance, services to production only, avoiding cross-entries and the confusion of inter-dependent accounts. This is a simple, practical, and useful device.

Wednesday morning the labor distribution is ready (figures for the first three or four weeks have been compiled previous to the closing date, with amounts for the final week added to the compilation on Tuesday evening). The wages charge is entered on the report for each cost center, and the accountant can now proceed to complete his report. This involves calculating the standard, allowed, and actual expense, for each of 20 to 25 cost subdivisions (materials, labor, security, power, services, insurance, taxes, depreciation, etc.) and developing the item or group variances attributable to (a) efficiency and (b) other causes, plus necessary statistical data on yields, output per machine hour, labor proficiency, and the like (entered on the reverse side of the cost report form illustrated in Exhibit 2).

This is a big job, but when efficiently organized and adequately subdivided it can be handled very fast. In big Plant A, with a multi-product output and about 90 cost centers, there are 8 area cost men and 2 general supervisors, with a like number of clerical assistants. In smaller Plant B, having a single product of 40 cost centers, the work can be handled by 2 cost men and 1 clerk. Overhead expenses, in some 40 subdivisions, are compiled by a single accountant with some nominal clerical assistance.

The cost reports are written up in long-hand on pre-printed "duplicating masters". These are supposed to be finished and ready for review at the area supervisor level by Thursday afternoon (1½ days after the last entry is received). Any gross errors disclosed by the joint study of the figures by the area accountant and area supervisor are corrected before the story goes any farther. On Friday the reports are duplicated, assembled, and distributed to all concerned (plant superintendents and department heads can take theirs home Friday evening, while plant managers and the executive staff get theirs Monday morning, accompanied by a textual summary from the plant accountant in charge). The full time table is shown in condensed form in Exhibit 3.

CLOSING SCHEDULE

| Primary Record | Cut-Off Time | Summary of Report | Write-up Time |
|---|---|---|---|
| Vouchers payable | Thu. p. m. | Voucher distribution | Friday |
| Stores requisitions | Thu. p. m. | Maint. job charges | Friday |
| *Time tickets | Thu. p. m. | Maint. expense distrib. | Saturday |
| Sales invoices | Fri. p. m. | Sales summary | Saturday |
| Wage earnings | Sun. p. m. | Pay roll, incl. distrib. | Tuesday |
| Production | Sun. p. m. | Production summary | Monday |
| Inventories | Mon. a. m. | Inventory schedule | Mon. -Tue. |
| Journal entries | Tue. p. m. | Cost reports | Wed. -Thu. |
| Ledger closing | Wed. p. m. | Financial statements | Friday |

*Maintenance labor only; all other labor charged out on pay roll distribution.

**EXHIBIT 3**

This is par for the course. An extra stroke now and then is not to be avoided, but a good crew should be able to shoot in the low 70's every time out. Holidays, illnesses, machine breakdowns, and clerical blunders, occasionally cause delays, but they can be offset by tight supervision and extra effort, and usually are.

The program should be laid out to eliminate any *scheduled* overtime. If this is done, some overtime hours can be applied when necessary to compensate for personnel or equipment failures, or bad luck of other kinds. In Plant A of the company mentioned, the maintenance distribution has to be run on Saturday and the pay roll distribution Tuesday evening, but these are the only jobs scheduled outside of regular working hours (the few machine operators involved get compensating time off later in the week).

### General Accounting Work

While all this is going on, the general ledger section is equally busy. It is not necessary, of course, to complete the bookkeping before the reports are prepared, but when the job is finished the two sets of figures must be in agreement. In practice, an effort is made to balance out each section of the reports with its control as the work proceeds, with the final trial balance coming off about the time the income statement and balance sheet are put together.

All accounting data are written up on pre-numbered standard journal entries, one for each type of transaction (vouchers, sales, cash, accruals, etc.), and the figures developed from the various primary sources become simultaneously the basis for the cost reports and the book entries. Preparation of entries by the general ledger section continues until Tuesday evening (with the pay roll distribution the last item recorded). After that, no journal entries affecting the cost controls may be originated from the ledger (any last-minute items that show

up in the general accounts are "suspensed" till next month). The cost section itself may, however, put through adjustments (disclosed in report preparation) until as late as Wednesday evening.

Working with the ledger figures, and with data furnished by the cost men, each plant accountant must complete, on Friday, the three major reports on the results of his plant's operations, namely: (1) sales revenues, product costs, and gross margins, current and cumulative, with budget comparisons, (2) sales volume, price, standard cost, and margin contribution for each type of product, (3) manufacturing, purchase, and inventory variances, by cost center and by expense component. This last one is the real "lulu," involving the final reconciliation and interpretation of everything that has gone before, and by the time it is finished on Friday evening the plant accountant in charge will feel that he is well entitled to Saturday and Sunday off.

At the head office, the chief accountant is pulling together the control figures from his outlying plants, branches, and sales offices, and clearing the interplant entries to the local accountants concerned. All data on income, expense, inventories, and property accounts come from the individual plant and staff accountants; figures on cash, receivables, and financing charges are supplied by the treasury section. Consolidated results and position data are furnished to the chief financial officer in "draft" form on Friday afternoon, then typed up and formally reported to the president the following Monday.

### Necessary Preparatory Activities

Any experienced accountant will recognize that such a goal cannot be attained merely by last-minute enthusiasm and effort, no matter how great they may be. A sine qua non of success in such an undertaking is thoroughgoing, meticulously careful advance preparation for the task, with every possible step taken ahead of time and every minute of the closing period reserved for some vital feature of the month-end work. Nothing must be left for the final days if it can be done in advance. Nothing must intrude on the crucial period unless it contributes importantly to the job at hand.

The first attempts to meet early deadlines are almost sure to disclose work that has to be done *now* though it could just as well have been done earlier. A checklist of matters to be attended to before the closing date arrives will include the following preparatory steps, which cannot be neglected:

1. Head up all report forms, data summaries, calculation formulae, work sheets, journal entries, and posting media, leaving for insertion only the amounts.
2. Prepare actual entries for all items determinable in advance (e.g. insurance, tax, depreciation, and amortization accruals and write-offs, fixed rental and interest charges, pension contributions, professional fees, scheduled contributions, and other payments).

3. Calculate in advance all allowances which either must or can be approximated (e.g. monthly salary totals adjusted to a fiscal-period basis, "fringe benefit" provisions based on payrolls, purchased fuel and energy charges).
4. Run cumulative sub-totals through next-to-last day on all significant data reported daily (e.g. production, sales, material withdrawals), so that only one or two days' figures must be added after the closing date.
5. Post on the actual report form all figures obtainable in advance (e.g. budgets, standard unit costs, prior period data, known fixed charges).
6. Report cumulative statistical data on minor items through preceding period only (thus avoiding last-minute calculations after actuals for current period have been compiled).
7. Set up inter-center charge re-distributions at pre-determined amounts, wherever relating them to current factors is not of major importance.

Other valuable preparatory work includes scanning the voucher record for unusual charges as the month proceeds, so that abnormalities in the recorded results may be avoided by "spreading" or "smoothing" items paid in one period but applicable to several. Similarly, the most satisfactory treatment for major accounting adjustments (e.g. inventory shortages and re-valuations) should be determined in advance, so that reports will not be delayed by last-minute debates on the subject. Most of the typical "hold-ups" in completing the statements involve issues that could have been settled beforehand, had some attention been given to the problem at the appropriate time.

### *Use of Preliminary Estimates*

Most of the foregoing discussion relates to speeding up the conventional process of compiling and reporting financial data—doing the regular bookkeeping job but doing it faster. This is all very commendable, but it does not fully meet the requirements of the accountant's job as an on-the-spot, up-to-the-minute news reporter. The alert and attentive manager wants to know about his results just as soon as the period has ended. What can the accountant do to supply that information?

Faced with this problem, most people with accounting experience tend to seek ways to accelerate further the normal bookkeeping process. They think of how entries can be made up and posted earlier. There is a temptation to set back the "cutoff dates" (to allow more time for the work), thus developing a statement that can be presented earlier in the month but only by omitting the occurrences of the last several days of the period ostensibly covered. This is misleading and futile.

An alternative is to develop a statement of results by a non-bookkeeping approach—i.e. determine the probable components of the income statement and balance sheet by independent observation and reasoning. An accountant who has never tried this may be surprised to find how easy it is to reach a rough approxi-

mation of earnings, assets, and equities, without reference to any journal entry or ledger account. He may be even more surprised to find that the boss has already done it, using a few basic facts that are quickly obtainable the day after the period ends. A top executive's reasoning may easily go like this:

> "Last month we sold 10,000 units and the plant turned out 12,000 units against a rated capacity of 15,000 units. Margin over standard plant costs normally runs about $4 per unit; that means our gross margin would have been about $40,000 if there had been no unfavorable production variance. Efficiency has been pretty good, but our fixed costs are about $3 per unit, and for the 3,000 units we were short of full production we'll probably show factory expense unabsorbed by about $9,000. That leaves an adjusted gross margin of $31,000.
>
> "If I take off $12,000 for selling and administrative, and $1,000 for bond interest, that will leave a pre-tax profit of $18,000 and net income of maybe $9,000. Ho-hum—thought we'd do better. Still, last month showed $7,000 on a little less volume, so $9,000 is probably about right. Have to see how it checks with the accounting figures 2 or 3 weeks from now, if I can remember it that long."

The point is that an estimate of this kind, intelligently made on the basis of experience and insight, is likely to be reasonably accurate, and good enough for all practical management purposes. The "book" results, when finally reported, may not express the truth with any more precision than a careful estimate which gives due weight to all really significant factors. All accountants know that the superficial exactness of bookkeeping data is highly deceptive. The machine grinds out only what is fed into it, and every company's accounts are as fallible in content as they are unimpeachable in method.

This furnishes a double reason for the accountant to adopt the boss's method, with the numerous refinements he can so readily apply—first to appropriate to himself the task of making the estimates (since estimates are bound to be made) and, second, to provide a check on the soundness of his conventional accounting procedures (since a discrepancy may as easily reflect on the bookkeeping as on the estimating). Reluctantly or eagerly, as his bent may be, he should set himself the task of presenting the results, in preliminary form, by evening of the first day after the period ends.

### Income Determination

What are the factors affecting income and how can they be reduced to rough measurement before the entries are posted and the account balances determined?

In a typical industrial enterprise they are surprisingly few, and most of them can be evaluated quite accurately with a minimum of investigation and study.

Start with gross revenues, which will usually be chiefly from sales. As soon as the last invoice has been issued, the sales total can be determined with exactness and in whatever classifications may be needed. Returns, allowances, and bad debt provisions are also quickly determinable (they can be cut off a day early if need be). Outbound freight may be a little troublesome to calculate, but any orderly method of keeping track of it will provide a good figure right away.

Next comes cost of product sold. The cost at standard is easily available, figured either as an average for the known product mix or item-by-item as the sales recording has proceeeded (if necessary due to wide variations between items). The production variance component is more difficult to calculate, and deserves the special consideration given to it in subsequent paragraphs.

Overhead expense—research, engineering, administrative, marketing, etc.—should not vary much from established budget limitations, and usually can be pre-determined with considerable accuracy. In ordinary course, none of these items is likely to fluctuate violently from period to period. If a sharp change does occur, it will ordinarily be due to special developments against which the accountant should be forewarned and forearmed. Extraordinary deviations from normal may relate to the operations of a period much longer than a month, and may thus require some "equalization" or deferral, not a sudden lump-sum expense charge of abnormal amount.

Interest and amortization charges are in line with a known pattern and can be foretold with precision. Income tax provisions are a function of pre-tax income and offer no problem. There remains, then, merely the difficult job of estimating the production expense variance, and such associated variances on purchases and inventories as may require accounting recognition in this period.

What this boils down to, of course, is the rather obvious fact that management should know, and can easily find out, how much profit will develop from any given volume of sales if product costs are at standard and overhead expenses as planned. The only uncertainty is: how much did actual manufacturing costs differ from standard? Answer that question and the problem is solved.

### *Estimating the Production Variance*

What are the factors which cause costs to exceed or fall short of their predetermined standard? The two influences most commonly identified are efficiency and volume. In the first class fall gains or losses in materials utilization, product yield and quality, waste and scrap percentages, worker efficiency, down-

time, length of run, power consumption, and the like. In the latter category are the fixed charges under-or-over-absorbed due to production levels lower or higher than those on which the standards are based.

The volume variance for any period should not be too difficult to estimate. It amounts to the standard fixed expense component per unit times the number of units by which actual output fell short of (or exceeded) the standard quantity. Where the entire factory is engaged in an integrated, continuing process, terminating in the production of a single finished product (e.g. synthetic fiber production), with all the constituent processes geared to a fairly consistent output level, the volume variance can be estimated for the plant as a whole. Where various departments are independent and run at different levels, the volume variance may have to be calculated for each department separately. This is more work but involves no serious difficulties.

The efficiency variance is more troublesome to estimate, involving too many elements to permit of a simple solution. The most practical approach may be to take last month's experience in each major cost center and solicit an educated guess from the area accountant and area supervisor as to how much better or worse things have been recently. Where day-to-day reports are compiled on yields, waste, idle time, and the like, these may furnish a guide as to the overall result which may be expected. This item may tend to become a pure guess, but it is noteworthy that in no other phase of the estimating job must unaided guess-work be employed.

Further light may be thrown on the reasonableness of the production variance estimate by an analysis of its make-up by types of expense. The actual work-in-process input by elements can be rather quickly determined from material usage summaries, pay roll distributions, and expense vouchers. If the amount flowing into or out of process inventories can be approximated (from preliminary inventory data), the remainder will represent the *actual* cost of product made. A comparison with the *standard* cost of product made (similarly resolved into expense components) will provide a break-down of the variance by class of expense, with inspection providing a test of the plausibility of the result. The method, illustrated in Exhibit 4, is not universally applicable, but of value in some circumstances.

The "variance estimate" is, of course, only one of several possible approaches to the determination of "cost of goods sold". Under some conditions a figure can be derived by taking total work-in-process input and estimating the inventory increases or decreases at levels, including finished goods. This method is often quick and easy, and reasonably accurate, but affords less basis for subse-

ILLUSTRATIVE VARIANCE ESTIMATE

| Quant. Made 3,000 pcs. Mfg. Cost: | Standard Cost Per Unit | Standard Cost Total Amt. | Actual Cost Estim. Outlay | Actual Cost *Proc. Invty. | Actual Cost Fin. Gds. | Variance Estim. Amt. |
|---|---|---|---|---|---|---|
| Materials . . . . | $ .10 | $ 300 | $ 346 | $ 10 | $ 336 | $ 36 |
| Labor . . . . . | .14 | 420 | 511 | 14 | 497 | 77 |
| Fuel & Energy . . | .04 | 120 | 139 | 4 | 135 | 15 |
| Supplies. . . . . | .02 | 60 | 57 | 2 | 55 | ( 5) |
| Insur.-Taxes. . . | .03 | 90 | 130 | 3 | 127 | 37 |
| Depreciation. . . | .08 | 240 | 325 | 8 | 317 | 77 |
| Total . . . . . | $ .41 | $1,230 | $1,508 | $ 41 | $1,467 | $237 |

Note - All figures hypothetical - for illustration only
* Assumed 200 units half complete

**EXHIBIT 4**

quent re-checking to account for discrepancies—one of the most valuable features of the entire program, as noted in the concluding comments which follow.

### *Testing for Reasonableness*

Income statements, to gain acceptance, must "make sense"—that is, they must tell a story which sounds plausible to those in charge of the business. If trends are favorable, managers expect to see profits increase; if accounting reports show the contrary, they become suspect, unless supported with persuasive explanations. Preliminary estimates are especially vulnerable to attack, and thus are in particular need of stout defense at every point.

This merely emphasizes the importance of what should be the core of all estimating procedure—a search for figures which express the *expectable* result of known activities. In this effort the accountant must use his comprehension, insight, and astuteness to arrive at the answer, instead of placing reliance exclusively on mechanical recording procedures. Clearly, he must understand the business, be in touch with all significant developments, and know how to evaluate the factors involved. He must think like a manager, talk management language.

Fortunately for the accountant, there are usually several available tests of the reasonableness of a preliminary income estimate. Certain ratios come to be accepted as normal. Any wide deviation arouses question. Changes from the preceding period should be explainable, item by item. Differences between results as now estimated and as previously projected for the period (either in the original budget or in a month-to-month forecast) will require comment.

ILLUSTRATIVE INCOME COMPARISONS

| | Curr. Mo. Prelim. | Curr. Mo. Forecast | Ov.(Und.) Forecast | Prev. Mo. Actual | Ov.(und.) Prev. Mo. |
|---|---|---|---|---|---|
| Sales: | | | | | |
| Quantity (pcs.) | 3,500 | 4,000 | ( 500) | 3,200 | 300 |
| Gross Value | $2,100 | $2,400 | $( 300) | $1,920 | $ 180 |
| Allowances | 100 | 100 | - | 80 | 20 |
| Net Value | $2,000 | $2,300 | $( 300) | $1,840 | $ 160 |
| Cost of Goods: | | | | | |
| Standard | $1,435 | $1,640 | $( 205) | $1,312 | $ 123 |
| Variance | 237 | 200 | 37 | 250 | ( 13) |
| Total | $1,672 | $1,840 | $( 168) | $1,562 | $ 110 |
| Gross Margin | $ 328 | $ 460 | $( 132) | $ 278 | $ 50 |
| Overhead: | | | | | |
| Research | $ 77 | $ 75 | $ 2 | $ 66 | $ 11 |
| Administration | 31 | 30 | 1 | 30 | 1 |
| Marketing | 132 | 140 | ( 8) | 121 | 11 |
| Total | $ 240 | $ 245 | $( 5) | $ 217 | $ 23 |
| Pre-tax Income | $ 88 | $ 215 | $( 127) | $ 61 | $ 27 |
| Income Tax | 40 | 110 | ( 70) | 26 | 14 |
| Net Income | $ 48 | $ 105 | $( 57) | $ 35 | $ 13 |

Note - All figures hypothetical - for illustration only.

**EXHIBIT 5**

For this purpose the income statement must be condensed into a very few items, each reflecting a group of activities of homogeneous nature and predictable behavior. A comparison of each item (i.e. group sub-total) with its expected amount, and with its actual amount in the preceding period, will quickly disclose any abnormalities that require investigation. A work-sheet form used for this purpose by the subject company is presented in Exhibit 5, though the illustrative figures are purely hypothetical and have no relation to the affairs of this particular business.

The analysis is simple. An increase or decrease in sales volume should produce a corresponding change in gross margin at standard. An increase or decrease in production should have a predictable effect on volume variance. An improvement or deterioration in operating performance should be reflected in the efficiency variance. Only substantial, known alterations in the research, development, and promotion programs should cause wide fluctuations in overhead expenses. Extraordinary charges of large amount should not take the accountant by surprise, since such events necessarily cast a shadow before them.

With these tests available for checking preliminary estimates, it is only a short step to the forecasting of results in similar terms. Given a sales estimate

and a production estimate for the next succeeding period, the accountant can quickly construct a projection of the income which should result.

The preliminary figures furnished to the manager on the first day of the month will be doubly interesting if the results for the period just ended are enriched with comparable data on what may be anticipated in the period just beginning. This is not a prediction (which accountants abhor). It is a *projection* of the expectable result at a given activity level *if attained* (which accountants must constantly prepare if they are to be of maximum usefulness to management). This forecast can then be used from week to week during the following period to estimate the profit being earned, as data on current shipments and production become available.

### Post-Checking the Results

Businesses differ and methods must be adapted to conditions. The foregoing comments have been based largely on the experience of a single company in a single industry. The suggested methods may not be applicable, in particular, to any other enterprise, though the general line of attack can be successfully followed in almost any line of business. A versatile and ingenious accountant can present a good preliminary income statement and balance sheet on the first working day after the closing date, and can finish all his bookkeeping and all his statements four days later. With modern electronic computing equipment, he will soon be able to do even better.

With a lapse of only four days between preliminary and final statements, even a bad blunder in estimating will go uncorrected for only a short time. Even when the interval is longer, serious damage is unlikely to result. In one large enterprise with which the writer has been associated, the directors for years have made all their decisions on the basis of preliminary figures presented at a meeting soon after the beginning of the month. Final "book" results have never been sufficiently different to merit attention.

An important thing to remember in this connection is that the preliminary figures may be, for management purposes, fully as dependable as those later developed from the "books of account". Discrepancies may indicate, not that the estimates were bad, but that the bookkeeping was bad. A thoughtful analysis of "period accounting" in the average concern is likely to disclose rather shocking distortions of fact in the stated results (charges "doubled up" or omitted, revenue and cost items improperly matched, long-term expenses absorbed in a single period, outside service charges picked up at random as invoices filter through, program changes altering the proportions of capitalized engineering and devel-

opment charges, and so on). It is idle to pretend that bookkeeping results are unimpeachable merely because they are mathematically accurate; too much evidence to the contrary is readily available.

Not the least valuable attribute of preliminary figures, accordingly, is the opportunity they afford for a post-check of the two sets of data, to determine what differences exist and what they mean. This job should be done faithfully and in detail, for out of it will come a far better understanding by the accountant of what is in his statements and how it got there. Every discrepancy represents either an oversight or inaccuracy in the estimating procedure, or a distortion in recorded results stemming from accident or neglect in formulating the bookkeeping entries. The accounts should have no secrets from the accountant.

With care and practice any discrepancies of significant amount should gradually disappear. Preliminary income estimates should differ from final book figures by not more than one to one and one-half per cent of gross revenues, perhaps five to ten per cent of net profit. If the usual discrepancy is within those limits, an occasional variation of twice the normal amount will do no damage, and should merely alert the accountant to the presence of factors he does not yet fully understand. The fear of ignorance is the beginning of wisdom in this endeavor, and no accountant should rely comfortably on what his books say unless he can demonstrate that they are telling the truth.

# Ingredient Costs of Paperboard for Folding Cartons

by WILLIAM F. YEATTS

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*This paper concerns the methods available—and their relative practicability and serviceability—for costing the material element of paperboard, known as "furnish." It is pointed out that, although in manufacture, paperboard making is a strictly process-type industry, conditions of sale of various grades (made in sequence on the same machine) give it a job-type character, too. Most attention is given to the use of standards, with indication of their virtues and shortcomings in the circumstances and the possible preferability of estimated job-costs.*

RECLAIMED PAPER in its various forms is the principal raw material used in the manufacture of paperboard. Pulps, chemicals and colors are added in varying degrees. As to the manufacturing operation, itself, paperboard produced for folding cartons, to which this article is confined, usually consists of four parts, namely, a top liner, underliner, filler, and bottom liner, built up in plies or layers on a cylinder type paper machine. Each part is prepared from a furnish developed especially for it, so that the finished product will conform to the customer's specification regarding finish, ink penetration, color, bending, rigidity, mullen, tensile and other tests. Moreover, each part has its own distinct qualities and properties and requires special stock preparation equipment, mixing beaters, refiners, storage chests and screens. The individual parts are combined and made into a single sheet of paperboard when they reach the "wet end" of the paper machine.

A few preliminaries are necessary if the material on cost development is to be readily understood. The following introductory terminology may help the reader:

**Paperboard**—A paper of more than .012 of an inch in thickness.

**Furnish**—Formula or ingredients of a mix or batch.

**Folding Carton**—A light weight boxboard (paperboard) printed, cut to specified size, creased, pasted along one edge and shipped flat to the customer.

**Broke**—Converting spoilage.

**Runs**—Various customers' orders containing identical specifications, with the exception of caliper, which may be manufactured as a group from the same furnish.

As already indicated, paperboard is manufactured on a continuous process basis. Once the paper machine is set in motion, it runs 24 hours a day for extended periods before shutting down. Customers' orders are so planned that transition between grades and calipers is minimized as much as possible, to reduce "off-standard" production losses during the change-over from one grade and caliper to another. Also, preparation of the furnishes must be coordinated so that the four parts of the board reach the machine simultaneously, taking into account the fact that the stock preparation time may vary for each part.

### *Process Costs Usually Not Adequate*

The cost accounting methods commonly in use in industry are available to the paperboard mill accountant. Process costs may be used in some instances when the production for a given paperboard machine results in a product of uniform quality during the accounting period. For example, a paper machine devoted exclusively to the production of corrugating material would fall into this category, because there is no need to distinguish, cost-wise, between the various lots produced. All orders would share in the costs incurred on a per-unit-of-production basis. It then becomes a relatively simple matter to bring together the costs of materials consumed, labor expended, and the burden costs applicable to the accounting period, to arrive at the total manufacturing costs applicable to the production for the same period. However, as the qualities of paperboard used for folding cartons varies from order to order or run to run, the averaging of costs for a period over the product for the period is not adaptable.

### *Actual Order Costs Pose A Difficulty*

Paperboard for folding cartons will usually be costed on a specific or job order basis. The accountant must then choose between an actual, standard, or an estimated cost system. Each of these methods has certain advantages and disadvantages. If the process of manufacturing were such that the four stock preparation systems were furnished with the required quantities, the paper machine started up, the run completed, the production measured, and the paper machine shut down until the next group of four batches was prepared, an actual cost basis would be the simplest method of obtaining accurate costs. But this is neither practical nor economical under the circumstances. Once the paper machine starts up, it should be run continuously for the duration of the planned schedule. This makes it difficult to relate consumption of raw materials for the

purposes of costing on an actual basis. Stock preparation requires varying periods of time for each of the four parts of the board before they come together on the paper machine. Due to this time problem, successive orders undoubtedly will contain some portions of the furnish from both. It is then necessary to arrive at a basis of deciding what was produced by what material. Both succeeding and preceding runs must be taken into account.

When the orders are small, say four tons, the interim or odd lot production may amount to one or more tons. Unless the allocation is accurate, a sizable material cost error may result when using the actual basis of costing. As the length of the orders or runs increase, the margin of error for the factor decreases. Remembering that orders are planned so that the transition or changes from one order or specification to another is minimized, the possibility of using the same furnish for one of the parts on the next order is always present. In practice, this is more the rule than the exception. This makes it all the clearer that an allocation of consumption of the ingredients for the particular furnish must be made between the two or more orders involved.

### *Standard "Furnish" Costs — Possibilities and Pitfalls*

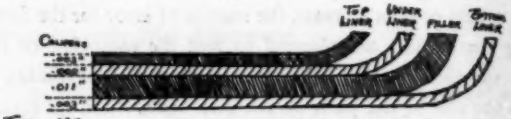
The variables involved in developing standards require careful scrutiny and a big assist from the technical staff if such costs are to be worked up. When we remember that the principal raw material used in the manufacture of paperboard is reclaimed papers in its various forms, it can be recognized that a uniform grading becomes essential on the part of a waste paper dealer and, in turn, proper grading on the part of the receiving personnel of the paperboard mill. This is particularly true in that there are as many as one-hundred or more grades of waste paper. Each grade may have a different retention factor or shrinkage percentage, which must be taken into account when developing the standard units of the material required per unit of finished paperboard. (Foreign matter, loading, gummed surfaces and other such items contribute to this shrinkage percentage.) Laboratory tests are required to determine the retention factors pertaining to the various grades of reclaimed paper.

In addition to the inherent losses present in the raw materials, a development of the necessary operating spoilage percentage is required in preparing standards for units of material required per unit of finished production. Operating losses may occur as a result of the following conditions:

1. Paper machine breaks.
2. Sewer losses.
3. Trim.
4. Screen rejects.

The greater portion of the operating spoilage finds its way back into production, but it can be salvaged only as the lowest furnish specification. The furnish requirements, therefore, for the part on which this furnish is usable must be reduced to the extent that provision is made for the operating spoilage.

The accuracy of standard costs also depends on the ability to maintain standard manufacturing conditions. Caliper deviations of the several parts will materially affect the costs. To illustrate, assume that a specific grade of paperboard was made up as follows:



Cross Section (Lengthwise)

If the caliper of say the underliner should vary .0005", this would represent a material deviation from standard of 16⅔ per cent for that part of the furnish and, very possibly, would also represent an equivalent deviation for another part.

Storage facilities and availability of specific grades of reclaimed paper frequency affect the cost picture when standards are used, because of the possible need to substitute one grade of paper for another. Substitutions for the standard grades could result in the reduction of costs but, more likely, the reverse would be true. When standard furnishes are established, consideration must be given to the selection of the best grades of paper stocks at the lowest possible cost which will result in the finished product meeting or exceeding the customer's specifications. On the basis of this premise, grade substitutions would be likely to be of a higher quality at a higher cost. Furnish revisions are sometimes necessary during the run in order to maintain specifications. Although the ingredients of a standard furnish would normally result in a finished product of the required quality, occasional lots of reclaimed paper may be below the usual specifications and substitutions become necessary.

In short, standard costs may be developed and used but do give rise to types of variances (when compared as they should be, with actual costs) which are exceedingly difficult to measure. These sources of variance have been identified and described above as:

1. Retention percentage
2. Operating spoilage
3. Caliper variations
4. Substitutions
5. Furnish revisions

### *Using Advance Estimates for "Furnish" Costs*

In order to take into account current conditions, current estimates may provide a means of obtaining more accurate costs than established standards. The furnish would be identified prior to the run by the superintendent or laboratory and would take into account such factors as availability of materials, quantities of materials on hand and delivery dates of materials prior to and during the run. On the basis of this information, a realistic furnish requirement could be developed.

Yet, the accountant may find that, in spite of this determination, substitutions have occurred during the run. On the basis of the actual consumption records, a revision of the estimated furnish can be made by the accountant so that the substitution is reflected in the requirements per unit of finished production.

### *Two Ways of Computing "Furnish" Requirements*

Several methods of computing furnish requirements may be used. Assume that a formula, either standard or estimated, for the specific grade contains the following materials for one of its parts (top liner in this case):

| Top Liner | Pounds |
|---|---|
| Pulp No. 4 | 500 |
| Paper stock No. 2 | 880 |
| Paper stock No. 73 | 520 |
| Chemical No. 3 | 50 |
| Chemical No. 5 | 50 |
| Per batch | 2000 |

The total caliper of the paperboard, say, is .020" made up as follows:

| | Caliper | Per Cent | Pounds/Ton |
|---|---|---|---|
| Top liner | .004" | 20.00% | 400 |
| Under liner | .003" | 15.00% | 300 |
| Filler | .010" | 50.00% | 1000 |
| Bottom liner | .003" | 15.00% | 300 |
| | .020" | 100.00% | 2000 |

One method of obtaining the standard pounds required per ton of finished production would proceed as follows:

| Ingredients | Pounds/ Batch | Per cent | Retention | Yield before operating spoilage | Yield after operating spoilage | Furnish lbs/ton |
|---|---|---|---|---|---|---|
| Pulp No. 4 | 500 | 25.00% | 95.00% | 23.75% | | 134 |
| Paper stock No. 2 | 880 | 44.00% | 95.00% | 37.40% | | 238 |
| Paper stock No. 73 | 520 | 26.00% | 79.00% | 20.54% | | 139 |
| Chemical No. 3 | 50 | 2.50% | 60.00% | 1.50% | | 13 |
| Chemical No. 5 | 50 | 2.50% | None | None | | 13 |
| | 2000 | 100.00 | | 83.19% | 74.87% | 534 |

In this illustration, each ingredient in the batch is expressed as a percentage of the total (second figure column above). The basic shrinkage, or retention, is then applied, percentage-wise, to the applicable percentage of the ingredients to the batch, resulting in a yield before consideration of subsequent operating spoilage. By totaling the yield of each ingredient, a figure is obtained which represents the total material retained out of the total furnished. Next, consideration must be given to operating spoilage. Assuming a 10 per cent spoilage, it is necessary to apply a further reduction to the total yield of 83.19 per cent which becomes 10 per cent less, or 74.87 per cent. Inasmuch as there would be 400 pounds of this part (top liner) for each ton of finished product and only 74.87 per cent of the part remains after processing, it is necessary to furnish 534 pounds of the top liner batch ingredients to obtain the necessary 400 pounds included in a ton of finished product (400 divided by 74.87%). The 534 pounds are then distributed over the ingredients of the batch on that basis of the per cent of each to the total.

The corresponding computation would be completed for the under liner, filler and bottom liner. In the case of filler, however, provision would be made for the salvaged quantity representing operating spoilage. Assume that it was found that 1400 pounds of filler furnish (equivalent to the 534 pounds) were required. On a per ton basis, 10 per cent would be equivalent to 222 pounds (2000 divided by 90 per cent less 2000) and the 1400 pounds thus reduced. The remaining quantity of 1178 pounds would be prorated over the components of the batch as in the case of the top liner. All requirements for each part, expressed in pounds per ton, are thus obtained. Pricing and summarizations would follow in the usual way, according to the requirements of the accounting system.

There is another approach to the problem of determining standard or estimated furnish requirements. This time we will reverse the procedure, in part, at least. Using the same specifications, we will start with a quantity of finished production of, say, 100 tons. According to the specification, then, 20 tons, or 40,000 pounds of top liner (20 per cent) is included in the 100 tons. It is necessary to determine the quantity of each ingredient which would be required

to result in 20 tons remaining in the finished product. To arrive at the required furnish materials, one might proceed as follows:

| Ingredients | Pounds/ Batch | % yield after shrinkage and waste | Pounds yield per batch | Total pounds required |
|---|---|---|---|---|
| Pulp No. 4 | 500 | 85.50% | 428 | 13,351 |
| Paper stock No. 2 | 880 | 76.50% | 673 | 23,498 |
| Paper stock No. 73 | 520 | 71.10% | 370 | 13,885 |
| Chemical No. 3 | 50 | 54.00% | 27 | 1,335 |
| Chemical No. 5 | 50 | | | 1,335 |
| | 2000 | | 1498 | 53,404 |

By dividing the pounds yielded per batch (1498) into the pounds per batch (2000), the furnish pounds per thousand pounds of finished production, or 1335.11 pounds, is obtained. Extending this factor by the required 40,000 pounds of top liner results in a total furnish requirement of 53,404 pounds which, in turn, is prorated (detail of last column) over the ingredients of the batch on the basis of the pounds per batch. One advantage of this method of computing furnish requirements consists in the ease by which the cost of different calipers which may be included in the same run can be computed. The total furnish requirements per thousand pounds have been obtained and, by pricing the batch through the formula, the cost per thousand pounds is readily computed. By pricing and extending the several parts (top liner, under liner, filler, bottom liner) contained in the several different calipers, individual costs for each caliper of paperboard included in the run can be obtained. The total cost of each ingredient for all the different calipered stock included in the run is also readily computed.

### *Tests of a Cost System for Paperboard*

When weighing the merits of the several methods of costing, the accountant should consider the following factors:

1. Is the clerical cost required to do the job excessive in relation to the results obtained?
2. Does the system provide operating management with a means of measuring performance?
3. In an integrated mill, are the costs transferred to the next producing center sufficiently accurate?
4. Does the system provide a means of estimating cost of new business accurately?
5. Are plant reporting and inventory control procedures adequate for the system involved?

It is against these overall considerations that each of the methods outlined here should be judged for application in any particular circumstances. Costing is a "must" for effective operation of a paperboard plant but, equally, it "must" be accurate and serviceable costing.

# Service Shop Cost Control for Appliance Retailers

by LOWELL H. HULBIRT

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*Standard costs, work orders and parts inventory stock records are here recommended, in persuative fashion, to the attention of appliance retailers for use in service shop operations. On all of these topics, the author recognizes the conditions surrounding these operations and seeks to match control methods to particular control needs. Illustrative forms accompany the article.*

IT IS THE PURPOSE of this article to describe a means of showing how specific control techniques may be utilized to reduce costs and obtain maximum performance in appliance store service operations. Work done by service shops may be divided into four main categories as follows:

1. Repair and installation work done directly for customers for which the customer is charged the retail price for labor and materials.
2. Work done for customers on a no charge or warranty basis.
3. Work done for the selling department, such as testing and repairing floor demonstration merchandise, testing and repair prior to delivery of an article, and installation work not charged to the customer.
4. Reconditioning of used trade-in merchandise for resale.

## Standard Costs Ideal for Service Shop Cost Control

A very effective means for control over service shop costs as over those of industrial establishments is that of setting up dollar standards for each type of work and then comparing actual to standard costs for the units of work actually completed. In brief, a standard cost procedure may be said to consist of: (1) one or more parts inventories in which each item has been given a standard cost, which should reflect closely the current average procurement price, (2) a standard processing time for each productive operation performed in the shop, set by estimate, time study, or standard time data, (3) a standard labor rate per hour for each major class of work performed in the shop, (4) a standard burden rate to be applied to the standard hours of work produced, (5) a time and production reporting system which permits the accumulation of data from which actual and standard costs can be computed, (6) an accounting system that converts the time and production reports into control information for management.

Economic considerations govern here. The most inexpensive type is a cost standard based on past experience and adjusted to a satisfactory performance level by judgment on the part of the person setting the standard. A more costly type is the scientifically engineered standard compiled for each specific job and based on time studies and standard operating data. In any specific case, management must decide the proper type of standard, based on the savings which can be expected to result from its use. It should not be forgotten, in this connection, that, in order to operate a system of control based on the comparison of actual to standard costs, it is necessary not only to have developed the proper standards but also to record actual costs in such a manner that the comparison can be made. The necessary elements of a reporting system for actual costs are: (1) a shop order system, (2) a time reporting system which accounts for all of shop hours worked each day, and (3) a system of inventory control for all parts and supplies.

### Shop Work Order as Basic to Operation and Accounting

Whether or not standard costs are adopted, an efficient shop will want to operate as such accountingwise. A cardinal rule of shop operation is that all jobs for which costs are to be accumulated must be authorized by a work order that has been assigned an identifying number. The work order facilitates the collection and classification of labor and material costs and makes possible the analysis of profits or losses by individual job and by work category. A sample order for appliance service work is shown in Exhibits 1 and 2. A separate work order is generally issued for each different job released to the shop. In the case of service calls to the customer's home, a separate order should be written for each call. For articles brought into the shop for repair, a separate order should be written for each article unless several articles are done as a single job for the same customer. Where several items are to be installed at the same time in the customer's home, one work order may be written for all.

It is clear enough that work orders are proper for jobs done directly for customers, but how should service work done for the store itself be handled? For example, how about the testing and adjustment of appliances used as floor samples or the servicing of articles such as automatic washers before delivery to customers? How about repair work on defective or damaged merchandise received from a vendor or the reconditioning of used trade-in merchandise to make ready for resale? The answer is that these too should be covered by work orders in a manner suitable to each. The preparation of floor samples might be covered by a single weekly or monthly work order for each major type of article,

FACE OF WORK ORDER FORM

**WORK ORDER** SERIAL NO. 4336

| | | | | | |
|---|---|---|---|---|---|
| DATE | SHOP | DELIVER TO OR PICK UP | | PARTS LIST | AMOUNT |
| BY | | STREET / BOX | TOWN / STATE | | |
| TYPE OF TRANSACTION: CREDIT ☐ CASH ☐ | | CITY | | | |
| C.O.D. ☐ | 30 DAY ☐ | DELIVERY DATE | | | |
| INSTALL | NO. QUOTED INSTALL | CALL DATE | CALL COMPLETED | | |
| CREDIT AUTH. | | INSTRUCTIONS | | | |
| NEW MDSE. SOLD | | | | | |
| DEPT. | | | | PARTS | |
| SALESMAN | | | | TAX | |
| SALES TAG NO. | | | | LABOR | |
| AMOUNT OF SALE | | | | TOTAL | |
| | | | | INSURANCE | |
| | | | | SER. CHARGE | |
| MAKE | MODEL | SERIAL NO. | DATE PURCHASED | AUDIT TOT. | |

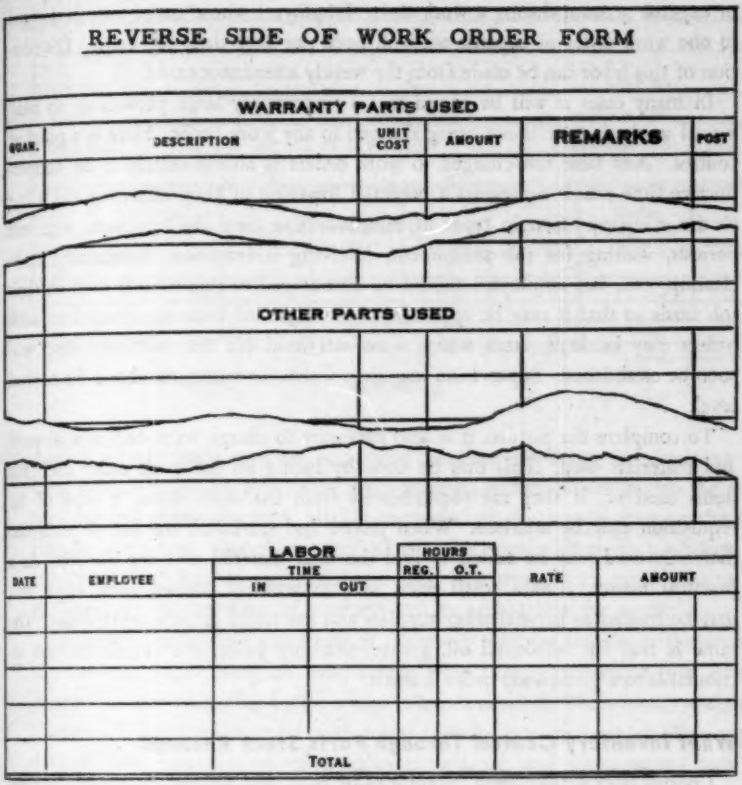
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TYPE OF WORK: FOREMAN'S APPROVAL | | RECONDITIONING USED MERCHANDISE INFORMATION | | | | | | |
| | | REPAIR | ACCT. NO. | SHOP NO. | EST. COST | ITEM | ACCT. | DEPT. |
| A ☐ FLOOR SAMPLE | D ☐ R/C OTHER | LABOR | | | | EST. RETAIL | | |
| B ☐ STOCK DELIVERY | E ☐ CHG. TO CUSTOMER | PARTS | | | | DEPT. COST | | |
| C ☐ R/C WARRANTY | F ☐ CARRIER DAMAGE | OUTSIDE SERVICE | | | | EXCESS ALLOWANCE | | |
| H ☐ RECONDITIONING USED | | CARTAGE | | | | TOTAL | | |
| | | BROUGHT IN BY | | | | DATE | RECD. BY | |

**EXHIBIT 1**

such as television, washing machine, refrigerator, dishwasher, etc. Preparation of merchandise for delivery to a customer can be handled in a similar manner. The repair of defective or damaged merchandise might require separation into major repair and minor repair categories. Major repairs would require a separate order for each, while minor repair and touch-up might utilize a blanket weekly or monthly work order. The reconditioning of used merchandise will generally require a separate order for each article.

In most shops the paperwork required by the shop order system will consist of more copies than can be made at a single writing. In addition to the copies used in the shop, itself, others may be required, for example, for pickup and delivery of the article being serviced, record of work sent to outside vendors, credit check for charges to the customer, accounting record of work in process, etc. It is therefore usually desirable to design the forms required for shop use and for all other related use as a set, and to use some mechanical reproducing process to obtain all necessary paperwork without laborious copying. The method of reproduction will vary according to the number of copies required.

Voluminous paperwork is often thought to be an essential part of close control. This is not always true. A well-designed consolidated set of forms keeps



REVERSE SIDE OF WORK ORDER FORM

WARRANTY PARTS USED

| QUAN. | DESCRIPTION | UNIT COST | AMOUNT | REMARKS | POST |
|---|---|---|---|---|---|
| | | | | | |

OTHER PARTS USED

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | LABOR | | HOURS | | | | |
| DATE | EMPLOYEE | TIME | | REG. | O.T. | RATE | AMOUNT | |
| | | IN | OUT | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | TOTAL | | | | | |

**EXHIBIT 2**

shop paper work to a minimum. Wherever employees spend time copying information from one document to another in a paperwork system, the chances for substantial savings through redesigning forms to eliminate copywork are excellent. Consolidated form sets offer the advantage of complete information on each part and the positive tying together of all related forms through a single serial number.

### *Charging Work Orders with Labor and Material*

A time reporting procedure is needed to accumulate actual labor hours charged to work orders or expense account numbers. Daily job cards should be supplied to service shop employees who may apply time to more than one work order

or expense account during a work shift. Employees whose entire time is charged to one work order or expense account, need not keep daily job cards. Distribution of this labor can be made from the weekly attendance cards.

In many cases it will be found that a surprisingly large portion of an individual worker's time is not being charged to any work order. Here is a point of control. Any time not charged to work orders is almost certain to be nonproductive time which represents a potential lowering of shop efficiency and a loss to the company. Certain types of nonproductive time are legitimate, e.g., rest periods, waiting for job assignment, receiving instructions, maintaining tools, cleanup, etc., but employees should be encouraged to report such time on their job cards so that it may be apparent. An analysis of time not charged to work orders may be kept, from which a normal level for the particular shop will soon be established. Supervision may then watch for variations above the normal level.

To complete the picture, it is also necessary to charge work orders with parts and materials used. This may be done by listing on the work order itself the items used or, if they are requisitioned from the stock room, a copy of the requisition may be attached. When priced and extended, the list of parts and materials used may be added to find the total material cost for the job. As a practical matter, certain small parts such as washers, screws, nuts, clips, etc., may be treated as general shop supplies and not listed on each work order. The same is true for incidental oil, grease, touch-up paint, etc., where the cost attributable to a given shop order is small.

### *What Inventory Control Through Parts Stock Records*

Control over service shop inventories of parts and supplies is one of the most essential parts of a control system. The fact that shop parts and supplies may, for financial reasons, be written off as a current expense when purchased does not make any less important the need for controlling them in the same manner as any other inventory. Considerable reduction in the investment required to facilitate service work may be accomplished through good inventory records and ordering practices.

Some of the same principles apply to the handling of shop inventories as to those in selling departments. It is important, for example, to maintain a good rate of turnover. This means that obsolete items must be periodically weeded out and adequate supplies of fast-moving items kept on hand. In the case of service work, the result of being out of stock, instead of a lost sale, is the stopping of a job in process, with a resulting loss of time and efficiency on the part of the shop man doing the work. Customer inconvenience and dissatisfaction and the loss of

PERPETUAL INVENTORY RECORD

ARTICLE _____ PART NO. _____

VENDOR _____ MINIMUM QTY. _____

UNIT COST _____ RETAIL SELLING PRICE _____ REORDER QTY. _____

| Date | Purchase or Work Order Number | Quantity Ordered | Quantity Received | Quantity Issued | Balance on Hand | Usage, Total Month To Date | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**EXHIBIT 3**

further service work may be occasioned by frequent delays in obtaining the parts needed to return articles to good working order. There is also the exasperating and expensive case, all too common, of the service man in the customer's home who, like the proverbial plumber, never seems to have just the right parts with him to accomplish the job. The result is inconvenience to the customer and the expense of a repeat call to accomplish the work.

In order to maintain a good rate of inventory turnover, minimize investment, and have the right thing on hand at the right time, a system of unit control records for each item used by the shops is recommended. The system consists of a perpetual inventory card for each item, (Exhibit 3) upon which all receipts, disbursements, amounts on order, balances on hand, and other control data are recorded. The control data commonly used are described in the following paragraphs.

An average monthly usage, developed from a summary of actual disbursements over a suitable base period, should be calculated and shown on each inventory card. Upward or downward trends in usage will be evident if weekly or monthly totals are listed in chronological order. A minimum stock or re-order point should be established for each item. When the balance on hand reaches this point, the item should be flagged for attention by an order clerk. Re-order points are not determined purely by judgment, but are set on the basis of a formula which relates the replacement time, average usage, and a standard "cushion" for unexpected or abnormal usage. Judgment is applied to the result obtained from the formula in order to recognize usage trends, known seasonal fluctuations, etc. The minimum re-order point may be set at zero for any items to be ordered as required rather than carried in regular stock.

The standard order quantity should be set to be that quantity found most economical to buy when the minimum stock re-order point has been reached. In establishing this quantity, consideration should be given to the average rate of usage, the cost of space required for storage, and the amount of money invested in the stock, as well as the unit price advantages for certain standard package quantities and price breaks for quantity purchases. Once a reasonable and desirable rate of turnover for shop parts and supplies has been established, the standard order quantity should be a balance between the maximum quantity allowable from a turnover standpoint and the minimum quantity allowable from a price standpoint. Complicated formulas may be developed for the cost factors involved to give the quantity theoretically best to buy. In practice, the same result can be obtained by use of some general rules and good judgment by the person setting the standard order quantities.

A standard unit cost for each inventory item may be recorded on the inventory card. This standard is usually an average of costs for the most recent purchases. It is kept up to date by recalculating the standard after a specific period of time or a specified number of purchases. The standard unit cost is useful as an answer to the question, what item cost should be used when charging costs to work orders, valuing inventory for dollar controls, and following accounting procedures to determine profit or loss for the service operation? It can also be used for estimating costs of repair and reconditioning work.

A standard retail selling price based on the standard unit cost may be established for items likely to be sold directly to customers, such as radio tubes and electric heating elements, and for items used on repair jobs where the customer is charged on the basis of time and material estimates. The standard retail price is, of course, adjusted whenever a change in the standard unit cost occurs. Additionally, it is often convenient to list the name and address of the preferred source of supply on the inventory card. This serves as a reference source for inquiries and simplifies the writing of requisitions for replacement of stock.

### *Other Inventory Control Measures*

In addition to the unit control for individual items provided by the perpetual inventory cards, it is desirable to measure and control the inventory investment and turnover as a whole. This can be done by calculating the value of the inventory at the end of each month and comparing the total with a predetermined control figure. Calculation of the inventory value does not entail much additional work if a shop report showing total parts and materials used for the month is being prepared for control purposes. Starting with the annual phys-

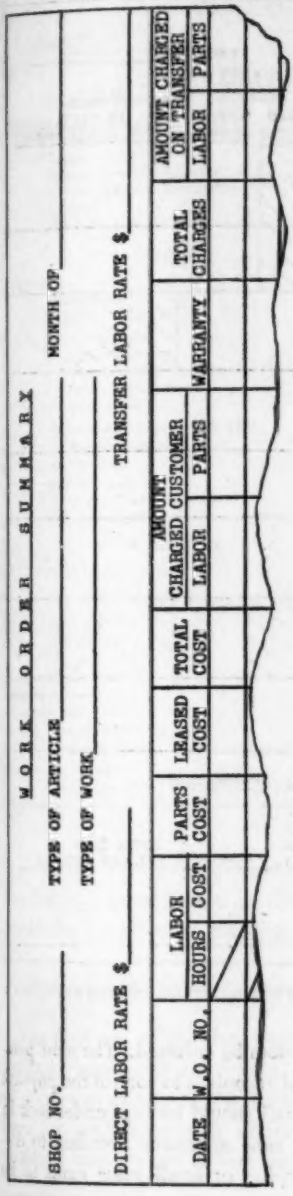



EXHIBIT 4

cal inventory, it is only necessary to add receipts and deduct disbursements to arrive at the inventory value each month. Receipts may be summarized from receiving slips or invoices and disbursements taken from the monthly shop report. Comparison of the total inventory value with the cost of parts and materials used for the month will give a monthly dollar turnover for the inventory as a whole. This single summary figure will show the effectiveness of the whole unit control system.

A useful device for increasing the efficiency of service shop technicians is the establishment of standard stocks of frequently used parts and materials which are kept immediately at hand at the shop bench and in the field truck. This practice assures field men of having the most needed parts on hand and, for the bench man, saves the time which would be required to obtain such parts from the stockroom. At the same time, control over the stock is maintained by requiring the individual to sign a requisition for the parts initially issued. Standard stocks may be replenished automatically from the listing on shop orders of the parts used, without the need for further stockroom requisitions.

A good inventory control system includes physical as well as paperwork control over parts and materials. In order for perpetual inventory records to be correct and the controls based on them to be effective, it is necessary

SHOP REPORT

SHOP: APPLIANCES (81-83-86) PERIOD OF: _____

| TYPE OF WORK | SHOP & ARTICLE | DIRECT LABOR | PARTS | LEASED SERVICES | TOTAL ACTUAL | AMOUNT CHGD. CUST. OR DEPT. LABOR | PARTS | BUDGET |
|---|---|---|---|---|---|---|---|---|
| A. Work on Floor Samples or Stock Prior to Sale. | 81-Washers<br>83-Refers.<br>86-Stoves<br>TOTAL | | | | | | | |
| B. Work on Mdse. to Make Ready for Delivery. | 81-Washers<br>83-Refers.<br>86-Stoves<br>TOTAL | | | | | | | |
| C. No-Charge Warranty Work After Delivery of Merchandise. | 81-Washers<br>83-Refers.<br>86-Stoves<br>TOTAL | | | | | | | |
| D. No-Charge Other Work After Delivery of Merchandise | 81-Washers<br>83-Refers.<br>86-Stoves<br>TOTAL | | | | | | | |
| E. Charge to Customer Time & Material. | 81-Washers<br>83-Refers.<br>86-Stoves<br>TOTAL | | | | | | | |
| F. Repairing Defective Mdse. or Carrier Damage. | 81-Washers<br>83-Refers.<br>86-Stoves<br>TOTAL | | | | | | | |
| G. Shop Time Estimating, Shop Tools, Delivery Time To and from. | 81-Washers<br>83-Refers.<br>86-Stoves<br>TOTAL | | | | | | | |
| TOTAL | 81-Washers<br>83-Refers.<br>86-Stoves | | | | | | | |
| | GRAND TOTAL | | | | | | | |

H. RECONDITIONING USED MERCHANDISE INFORMATION

| SHOP & ARTICLE | DIRECT LABOR ACTUAL | TRANSFER LABOR EST. | TRANSFER LABOR ACT. | PARTS EST. | PARTS ACT. | LEASED SERVICES EST. | LEASED SERVICES ACT. | CARTAGE | TOTAL COST EST. | TOTAL COST ACT. | TOTAL COST BUDGET |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 81-Washers | | | | | | | | | | | |
| 83-Refers. | | | | | | | | | | | |
| 86-Stoves | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | |

**EXHIBIT 5**

that the recording of all issues from the stockroom be enforced. The most practical way to assure completeness and accuracy of records is to control the physical availability of the stock. All parts and materials should be kept under lock in an enclosed stockroom, preferably with a full time stockroom attendant to disburse and receive material. Any general supplies or small value items to be

**SERVICE SHOP OPERATING STATEMENT**

SHOP_____ PERIOD OF:_____

| ITEM | PERIOD COVERED: BUDGET | ACTUAL | LAST YEAR | YEAR-TO-DATE BUDGET | ACTUAL | LAST YEAR |
|---|---|---|---|---|---|---|
| INCOME: | | | | | | |
| Sales - Parts | | | | | | |
| Sales - Labor | | | | | | |
| Sales - Service Policies | | | | | | |
| Sales - Recond. Trade-Ins | | | | | | |
| Cartage | | | | | | |
| Other Income | | | | | | |
| TOTAL INCOME | | | | | | |
| EXPENSE: | | | | | | |
| Parts Paid For | | | | | | |
| Supplies Paid For | | | | | | |
| Direct Labor: | | | | | | |
| Reconditioning | | | | | | |
| Chargeable to Customer | | | | | | |
| Other Productive | | | | | | |
| Shop Time | | | | | | |
| Outside Services Purchased: | | | | | | |
| Reconditioning | | | | | | |
| Other | | | | | | |
| Indirect Labor | | | | | | |
| Auto and Truck Expense | | | | | | |
| Other Expense | | | | | | |
| TOTAL EXPENSE | | | | | | |
| PROFIT AND LOSS | | | | | | |

**PARTS INVENTORY**

| | |
|---|---|
| Beginning Inventory | |
| Plus: Purchases | |
| TOTAL | |
| Less: Parts Used | |
| Ending Inventory | |
| Authorized Inventory | |
| Less: Ending Inventory | |
| SUB - TOTAL | |
| Less: On Order | |
| OPEN TO BUY | |

**EXHIBIT 6**

handled as a general shop expense should be requisitioned from stock in quantity as they are placed in the shop.

### *Performance Reports to Measure Shop Efficiency*

The final part of the shop control system is a comprehensive set of shop performance summaries and reports. These not only provide a picture of the degree of success or failure of the various control methods in use but also serve as a basis for positive action to improve results. The reports will indicate any areas in which costs are out of line with the established or normal pattern. Although

the scope of the reports which can be prepared for management will be determined by the operational composition of the shop control system, the following analyses should be made available with even a simple control system:

1. A weekly and monthly analysis which shows the distribution of labor and material costs between the various work categories and expense accounts.
2. A comparison of standard and actual costs by type of job for all work completed on work orders.
3. A comparison of the revenue received from jobbing work with the actual and standard cost of such work.
4. A monthly recapitulation that shows the value of inventory balances for various parts groups (possibly by commodity line), value of parts on order but not received, and value of parts usage for the month just completed. Cumulative totals for year to date, with pertinent percentage relationships indicated, will aid in enhancing the value of this report.
5. A monthly operating statement summarizing all income and expenses and showing the profit or loss for the period.

Typical of the control forms used by appliance service shops are the Work Order Summary (Exhibit 4), Shop Report (Exhibit 5), and Service Shop Operating Statement (Exhibit 6). If labor standards have been computed for the service shop operations, a weekly and monthly work performance report should be issued. A daily tally of work units completed in each section of the shop should be the basis of the performance report. Daily production figures can be summarized weekly and multiplied by unit labor standards to compute standard hours of work produced each week. Standard hours produced divided by actual hours applied to measured work during a week will afford a percentage of performance which shows the shop efficiency in relation to the labor standards. Other informative reports can be compiled as desired from the information that will be available from the work order procedure, the time and material reporting system, and the inventory control.

### *Study of Service Operations Fruitful for Retailers*

Owners of retail stores will be much more favorably inclined toward the adoption of the cost control methods outlined in this paper if they will realize that, from a net profit standpoint, one dollar saved by cost control in the service shops is worth five or six dollars of additional sales on the display floor. Furthermore, savings made through increased labor efficiency and better stock control can be obtained without the need for larger investments in inventory, equipment, or floor space. It is essential that retailers who maintain service shops as part of their business operations should become familiar with proven shop procedures such as work order systems, work measurement, inventory control, and standard cost valuation if they are to keep costs at the minimum and make service work a lucrative part of the store operation.

# Absorption Costing — A Practical Application

by ROBERT J. HOY

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*Procedures for allocating operating costs to product lines are described in this article, which advocates use of two burden rates to absorb total costs outside the direct material and labor areas. The author illustrates the specific use made by top management of information developed on total product costs.*

ADDITIONAL ATTENTION is needed in the average company today to problems of assigning costs to several lines of products. During the past few years, heavy competition has influenced many single-product companies to diversify for the first time in an attempt to enter less competitive markets. The current pressure by labor groups for a guaranteed annual wage program has made diversification a pressing problem wherever a company manufactures for a seasonal market. At all events, whether product diversification is new or old to a company, it brings with it a tendency to neglect full product costing.

Material and labor costs which can be assigned direct to products offer no particular difficulty. However, problems of allocation of indirect costs can become complex. It is easy to shrug off a number of the problems as insoluble and, on this assumption, to allocate large segments of cost on an arbitrary basis and not to allocate other costs at all. This need not be. A practical system for accumulating and reporting product costs in a medium-sized multi-product company is described in this article.

The company under consideration deals in assembled finished products which have many components machined from bar stock. There are machining facilities for complete processing of most of these components, as well as for assembly operations. Products are diversified but fall into ten general families or product lines. A standard cost system is in use. Accounts are maintained by product lines for sales and cost of sales and for inventories. Factory operations have been segregated into seven direct and eleven indirect departments.

### *Absorption Rates for Direct and Indirect Departments*

Of the direct departments, four contribute conversion labor and three contribute handling labor which can be charged directly to products. Work applicable to manufacture of parts is

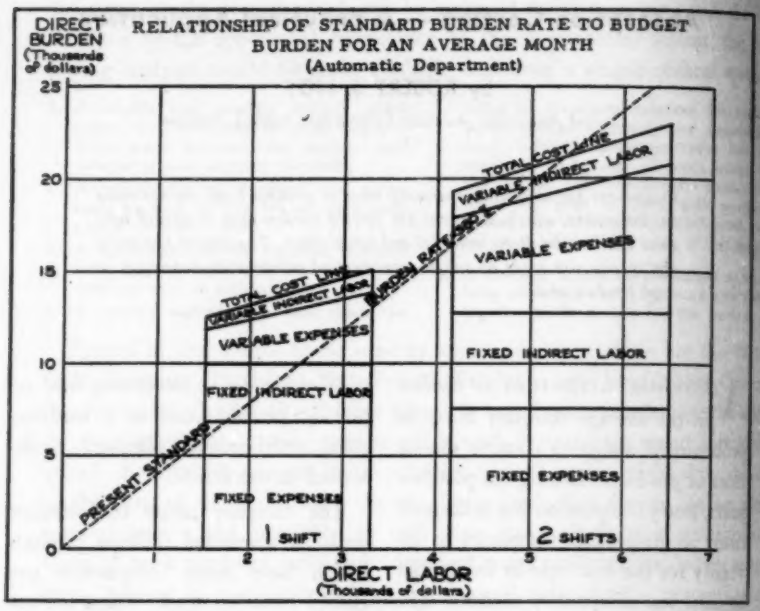


**EXHIBIT 1**

isolated from that applicable to assembly of finished products. Direct departments are:

- Automatic screw machine
- Secondary machine
- Metal finish
- Assembly
- Receiving
- Inspection
- Shipping

All applicable costs directly pertaining to their operations are charged to these departments. In addition to labor and supplies directly expended in the department, charges include apportionments of power, heat, light, depreciation, taxes, and insurance.

Through analytical studies, burden rates have been developed which will absorb departmental expense at a realistic level of normal activity. These rates rely on data yielded by the accounts, in which expense has been analyzed into variable and fixed categories and flexible budgets based on standard direct labor have been established for control purposes. Burden rates are not adjusted each year to reflect changes in estimated production activity, since the rates are deliberately pegged to absorb expense over long periods of time—overearning in good years and underearning in poor years. (Rates are adjusted yearly, or more often as necessary, to reflect

BASIS FOR DISTRIBUTION OF INDIRECT DEPARTMENT EXPENSE

| Department | Basis of Distribution |
|---|---|
| Tool Room | Hours of tool room labor by product line. |
| Maintenance | Hours of maintenance labor expended on facilities by product line. |
| Purchasing | Percentage allocation based on projected normal purchasing activity by product line. |
| Production Control | Percentage allocation based on projected activity by product line. |
| Industrial Engineering | Percentage allocation based on projected activity by product line. |
| Timekeeping and Payroll | Ratio of projected number of employees by product line. |
| Cost Accounting | Percentage allocation based on projected activity by product line. |
| Personnel | Ratio of projected number of employees by product line. |
| Stock Room | Percentage allocation based on average number of requisitions handled by product line. |
| Warehouse | Percentage allocation based on average area occupied by product line modified by turnover rate of products stored. |
| General Factory | Ratio of projected number of employees by product line. |

**EXHIBIT 2**

changed methods of production.) Exhibit 1 graphically portrays the relationship of a standard burden rate to normal departmental expense.

Indirect factory departments have been established to segregate satisfactorily functions which differ sufficiently in nature or relationship to products manufactured to require separate measurement. The departments are:

Tool room
Maintenance
Purchasing
Production control
Industrial engineering
Timekeeping and payroll
Cost accounting
Personnel
Stock room
Warehouse
General factory

Fixed budgets at step levels of activity are used to control expense in this area. Expenditures in these departments tend to remain static. Employees are, for the most part, technically or highly-trained personnel whose activities are largely independent of productive levels. Analysis of historical data and use of work measurement techniques, make it possible to determine absolute minimum manpower requirements for each of these departments and the points at which additions are necessary as production volume increases. Projected sales and manufacturing forecasts will give the approximate volume to be expected and permit advance planning for es-

BASIS FOR ALLOCATION OF VARIANCES FROM STANDARDS

| Account Name | Basis of Distribution |
|---|---|
| **Variances** | |
| Material price variance )<br>Freight on purchases )<br>Outside rework and salvage ) | Distribution to product line is made from an analysis of the purchase register which lists and summarizes the charges by product line. |
| Material usage variance | Distribution is based on analysis of excess material requisitions by product line. |
| Tool charges | Distribution of tooling costs to product line is made from lapse schedules which are prepared from the purchase register. |
| Direct labor variances | Direct labor variances of each department are distributed to product line on the basis of direct labor hours by departments and product line. |
| Provision for Inventory adjustment | Basis for distribution is the actual provision made by product line. |
| Gain, or loss, on disposal of productive | Allocated on the basis of what "end product" the material would have gone into. |
| Scrap and Salvage | Distribution is made from scrap and salvage reports by product line. |
| Over, or under, absorbed direct factory burden | Distributed on the basis of standard direct labor dollars by departments and product line. |
| Over, or under, absorbed indirect factory burden | Distributed on the basis of standard direct labor dollars by product line. |
| **Reductions** | |
| Scrap sales | Distributed on the basis of bar stock requisitions for scrap turnings, and of scrap reported for scrap solids. |
| Purchase discounts | Allocated on the basis of material cost of sales by product line. |

**EXHIBIT 3**

tablishing expense and manpower budgets.

Expense of these departments is normally not distributed to direct departments but is carried directly to product lines as product burden. Rates have been established for tool room and maintenance work, the cost of which is distributed to production orders and to productive departments wherever incurred. Remaining expense in these two departments and expenses in other indirect departments are allocated in budgeted amounts to product lines on various bases which are simple but reasonably accurate measures of expense incidence by product. Exhibit 2 lists the bases used for indirect departmental expense distribution.

Although variances should, strictly speaking, not occur, they do. Therefore allowance for a normal variation for operations as a whole should be provided. Through analysis of historical data and projected sales forecasts, a monthly budgeted figure can be determined for each variance. The

SUMMARY PROFIT AND LOSS STATEMENT

Month Ended _____

| | Actual | Budget |
|---|---|---|
| Net Sales | $ | $ |
| Cost at Standard | | |
| Gross Profit at Standard | $ | $ |
| Variances and Adjustments: | | |
| Material price | $ | $ |
| Material usage | | |
| Freight on purchases | | |
| Outside rework and salvage | | |
| Tool charges | | |
| Direct labor rate variance | | |
| Direct labor efficiency variance | | |
| Provision for inventory adjustment | | |
| Scrap and salvage | | |
| Over * under absorbed direct factory burden | | |
| Over * under absorbed indirect factory burden | | |
| Scrap sales * (Deduction) | | |
| Purchase discounts * (Deduction) | | |
| Total variances and adjustments | $ | $ |
| Selling and Administrative Expense | | |
| Total operating expense over standard | $ | $ |
| Net Operating Profit | $ | $ |
| Other Income and Expense | | |
| Net Profit | $ | $ |

**EXHIBIT 4**

several variance accounts in use and the basis for distribution of balances are shown in Exhibit 3. It will be noted that variances from established standards are charged to cost of sales accounts. Some of the variances occur regularly in the factory area but are not the type of item which it is desired to include in direct department burden rates. By removal to the cost of sales area they can be controlled overall, with department heads being advised of their responsible portion on a memorandum basis.

### *Burden Application to Product Lines*

For analysis purposes, burden applicable to manufactured products is divided into two general categories. The first category is direct factory burden. It is the burden picked up in direct factory departments, applied directly to products at standard rates along with standard direct conversion or handling labor. The second cate-

PRODUCT PROFIT ANALYSIS

Month Ended _____

| | Actual Profit | Forecast Profit | Favorable Unfavorf | Favor.-Unfavorf Volume | Cost | Variance Margin |
|---|---|---|---|---|---|---|
| Product Line A | $ 2,080 | $ 3,000 | $ 920* | $ 400* | $ 680 | $ 1,200 |
| Product Line B | 12,000 | 10,000 | 2,000 | 2,600 | 800 | 200 |
| Etc. | | | | | | |
| Total | $ | $ | $ | $ | $ | $ |

**EXHIBIT 5**

gory is allocated product burden and consists of all other burden, including indirect factory department burden, variance from standard, and administrative and development expense (for which there is not space for detailed discussion here, although it should be allocated to product lines on a rational basis). Each product line has a different spread of allocated burden which can be expressed as a percentage of standard direct cost by product line. The standard direct cost plus allocated product burden equals total product cost.

There are many problems in determining accurate distribution of costs to product lines, but all can be solved from a practical viewpoint, regardless of the type of business. If an item can be recognized as a cost of manufacturing, it can be evaluated and allocated to the area in which it belongs. Careful review and coordination of sales and production forecasts, work with all levels of management in establishing budgets, detailed analysis of work force in each factory department, studies of percentages of activity by product lines—all are necessary to develop reliable product costs.

### *Reporting of Costs by Product Line and Burden Classifications*

Under the method which has been described for determining total cost by product line, some simple, informative reports can be furnished to management each month. The form of the profit and loss statement in use is illustrated by Exhibit 4. The analysis of profit by product line statement is shown as Exhibit 5. In the profit and loss statement, the standard cost reported includes indirect factory department burden at standard rates. Over or under absorbed expense is shown under the variance section.

The product profit analysis statement requires further explanation since a worksheet, which is not shown, backs up this simple statement. Included in the worksheet for each product line

SUMMARY BURDEN ANALYSIS

Month Ended _____

| | Burden | | | Variance | | |
|---|---|---|---|---|---|---|
| | Actual | Budget | Absorbed | Total | Volume | Control |
| DIRECT DEPARTMENTS | | | | | | |
| Automatic Screw Machine | $ | $ | $ | $ | $ | $ |
| Secondary Machine | | | | | | |
| Metal Finish | | | | | | |
| Assembly | | | | | | |
| Receiving | | | | | | |
| Inspection | | | | | | |
| Shipping | | | | | | |
| Total Direct | $ | $ | $ | $ | $ | $ |
| INDIRECT DEPARTMENTS | | | | | | |
| Tool Room | $ | | $ | | | $ |
| Maintenance | | | | | | |
| Purchasing | | | | | | |
| Production Control | | | | | | |
| Industrial Engineering | | | | | | |
| Timekeeping and Payroll | | | | | | |
| Cost Accounting | | | | | | |
| Personnel | | | | | | |
| Stock Room | | | | | | |
| Warehouse | | | | | | |
| General Factory | | | | | | |
| Total Indirect | $ | | $ | | | $ |

**EXHIBIT 6**

are the following figures at forecast and actual levels: sales, direct cost of sales, allocated product burden, operating profit, and operating profit per cent to sales. Figures for profit are transcribed directly from the worksheet. Variances are then computed. Volume variance is regarded as the difference between forecast and actual sales times the forecast profit ratio. Cost variance is figured as the difference between forecast and actual allocated product burden. Margin variance is the total change not due to volume, less the expense variance. The margin variance may be due to difference in sales mix or changes in sales prices.

To illustrate preparation of product profit analysis figures, amounts applicable to Product A might be as follows:

| | FORECAST | ACTUAL |
|---|---|---|
| Sales | $30,000 | $26,000 |
| Direct cost of sales | 18,000 | 15,600 |
| Allocated product burden | 9,000 | 8,320 |
| Operating profit | 3,000 | 2,080 |
| Operating profit % to sales | 10% | 8% |

Volume variance = 10% x ($30,000 — $26,000) = $400 unfavorable

Margin " = $26,000 x (10% — 8%) = $520 unfavorable

Total net profit variance = $920 unfavorable variance

Over and under absorbed factory burden constitute the major variation in monthly operating costs and management has requested a report of bur-

den by department to provide a quick picture of factory performance. Where the product profit analysis statement discloses unfavorable cost variance, the degree to which factory operating personnel have helped or hindered the situation is presented in a form which enables management to direct attention to specific trouble areas. The statement is called a Summary Burden Analysis and is illustrated by Exhibit 6. For direct factory departments, actual burden, budgeted burden at the attained level of performance, and burden absorbed at standard rates are shown. Variation between absorbed and actual burden is segregated into volume and controllable categories by simple subtraction. Budgeted burden less absorbed burden equals volume variance. Actual burden less budgeted burden equals controllable variance.

For example, performance of the automatic screw machine department might be as follows:

| | |
|---|---|
| Actual burden | $17,000 |
| Budgeted burden | 18,420 |
| Absorbed burden | 15,200 |
| Total Variance (unfavorable) | 1,800 ($17,000 — $15,200) |
| Volume variance (unfavorable) | 3,220 (18,420 — 15,200) |
| Controllable variance (favorable) | 1,420 (18,420 — 17,000) |

Inasmuch as fixed budgets are used for control and distribution of indirect department expense, budgeted and absorbed burdens are the same. Here any variation from budget is considered controllable.

### *Uses Made of Product Cost Figures*

Management has found the allocated product burden percentage to be a very useful tool for estimating purposes. Direct product costs are relatively easy to determine. With these in hand, a quick application of one burden rate permits a determination of the net profit which can be expected on an item. If the item shows little or no net profit, a careful survey of the market will indicate whether this is a current problem caused by a price war, flooded market, etc., or whether it is a permanent condition. If the latter is the case, then the company picture must be reviewed. Possible new methods of production should be analyzed. Also propriety of the particular assignment of allocated product burden can be checked. If neither of the above provides a solution, then it is evident that the product should not be manufactured. However, if it is a large-volume product, it might be used for filler or to apply market pressure on competitors or for any one of several other reasons. The important thing is that management is aware of what the total cost is and can make a decision with full advance knowledge as to the consequences.

By the same token, on a high profit item, management can make a decision with reference to reduction in price, where the reduction on an item would engender a worthwhile increase in the firm's percentage of the total market. Again, the important thing is that management is aware of how much net profit is involved, before the decision is made. In short, the product profit analysis report enables top management to determine total operating profit quickly by product line, and to know how actual profit compares with forecast figures and in what areas operations have exceeded or fallen below expectations.

The segregation of variance into volume, expense, and profit margin categories has spotlighted the areas requiring management attention. Sales personnel can no longer evade their responsibility for volume and profit margin variances and factory management has stopped accusing the sales people of lack of sales effort when decrease in profit is in fact due to lack of expense control. Attention has been focused on low profit products through this reporting procedure, resulting in faster corrective action by management to eliminate undesirable items in the line.

A company must have good information available in order to use the system which has been described. Sales forecasts, budgets, and accurate accounting techniques are required. The procedures do not provide the answers to all of management's problems on product prices and costs, but they provide a practical, factual method of attacking many of problems which are otherwise either ignored or handled by rule of thumb.

## Allocating Administrative Expenses to Operating Units

by T. W. BLEGEN

*Internal Auditor, Transocean Air Lines, Oakland, California*

***In this quick review of administrative expense allocation practice of six companies in industries as diverse as meat packing and radio and television broadcasting, it is found that five regard it useful to know what portion of such expenses is applicable to the operations of principal plant and branch units and exercise some ingenuity in discovering the most appropriate method to achieve this objective.***

SHOULD ADMINISTRATIVE expenses be allocated to branches or other operating units? If so, what method should be used in making such an allocation? Why might one method be preferable to another method? This article is written to summarize information brought out in a discussion

of this subject among a group of N. A. C. A. members who described practices of their companies.

### A Meat Packer

The allocation method used by a meat packer with a number of packing plants and sales branches and striving to give management an idea of the extent each plant or branch and each department within a plant is operating at a profit or loss, consists of making an allocation to the packing plants on the basis of livestock slaughtered in the previous year. The packing plant, in turn, distributes general and administrative expenses to operating units (manufacturing and sales units) on the basis of relative sales on a five-year running average basis. Inasmuch as transfers between departments are made at sales value, the sales figures include transfers as well as sales to outsiders.

This packer operates accounting on a decentralized basis. To speed up the monthly closings, the administrative charges to the plants and branches must be made in advance. To achieve this, a budgeted or estimated amount is distributed, with the over or underabsorbed amount being retained on the home office books. As a result, unusual increases or reductions in general and administrative expenses do not affect the plant or branch results, because they remain in the home office as under or overabsorbed.

A large part of the administrative cost for this company is interest on borrowed funds. In view of this, the company at one time followed the policy of allocating administrative costs on the basis of the average investment in inventory and plant during the previous year. The method was abandoned because it tended to penalize the newer plants.

### A Dairy Company

A dairy had in recent years witnessed removal of certain of the administrative functions from the branches to the home office, where machines could be used more effectively. Administrative costs had been distributed on the basis of sales to outsiders only. (The distributions of the meat packer, described above, were on a basis of sales including transfers, since transfers were made at sales price. In contrast, interbranch transfers of the dairy company were being made at cost.) However, some branches selling the most and thus receiving the biggest charges for administrative expenses were getting the least home office services.

As more and more services previously performed at the branch level were taken over by the home office, the decision was reached that, as much as possible, work being done for a given branch should be charged directly to the branch. For example, all clerical personnel now keep track on daily time cards of the time worked on services for each location during the

day. As another example, the costs of the tabulating department are distributed to the operating locations on the basis of the number of cards processed for each location during the month.

These direct charges account for a large proportion of expenses in the administrative category. The rest, i.e., administrative and executive salaries of personnel not reporting on time cards, together with administrative cost not directly for the benefit of a given operating location, are still distributed on the basis of sales to outsiders but the amount distributed in this manner is relatively small in relationship to the total costs of the home office.

#### *As Automotive Parts Wholesaler*

A third company, the experience of which was brought into the discussion, is an automotive parts wholesaler. Bonus arrangements with branch managers provide that the branch manager will receive a percentage of the profits made by his branch before income taxes. The company has centralized accounting, credit, purchasing, and overall sales supervision in the home office. It has developed a formula for distribution of administrative expenses, which is based primarily on sales but has certain refinements which result in charging more administrative expenses to the branches requiring more service. The paperwork on interbranch transfers is about twice that of a normal sale and for warehouse shipments about three times that of the direct sale. Also the branch with more orders requires more service. Hence the allocation formula requires adding (for each branch and the company as a whole) net sales, double the branch transfer figure, triple the figure for shipments to warehouse for account of customers, and the product of number of orders handled and average company-wide value of orders. The allocation is on the basis of relationship of this total in each branch to the company total. As an example of how this might work out, the following assumptions are made for two out of a number of branches:

| | Total | Branch A | Branch B |
|---|---|---|---|
| Net sales | $1,000,000 | $100,000 | $100,000 |
| Interbranch transfers, net | — | 10,000 | ( 5,000) |
| Warehouse shipments to customers | 100,000 | 10,000 | 5,000 |
| Number of orders | 100,000 | 12,000 | 8,000 |
| Average dollar value of all orders (company-wide) | 10 | 10 | 10 |
| Administrative expense | 100,000 | | |

Under the formula, Branch A would receive a charge as follows:

$$\frac{\$100{,}000 + \$10{,}000 \times 2 + \$10{,}000 \times 3 + \$12{,}000 \times 10}{\$1{,}000{,}000 + \$100{,}000 \times 3 + \$100{,}000 \times 10} \times \$100{,}000 = \$11{,}739$$

Branch B, because of being a shipping branch instead of a receiving one for transfers and, having smaller warehouse shipments to customers and a lower number of orders, would receive a charge of only $8,043. The computation for Branch B is as follows:

$$\frac{\$100{,}000 - \$5{,}000 \times 2 + \$5{,}000 \times 3 + \$8{,}000 \times 10}{\$1{,}000{,}000 + \$100{,}000 \times 3 + \$100{,}000 \times 10} \times \$100{,}000 = \$8{,}043$$

Although both branches had the same sales volume, the service required in billing and accounting for Branch A's transactions, which were much more voluminous than Branch B's tend to be charged to Branch A under this formula whereas an allocation based on sales only would charge $10,000 each to Branch A and Branch B.

***A Radio and Television Broadcasting Company***

A broadcasting company was described as using an allocation of two-thirds of all administrative expenses to its television station and one-third to its radio station. The allocation was developed because approximately that relative proportion of time is devoted by the administrative personnel to the two locations. In addition, space occupied by the television operation is about twice the size of that for the radio station.

***A Bakery***

The practice of a baking company, introduced into the examples offered in discussion, indicated that it makes no allocation of administrative expenses. In the opinion of the company, the contribution margin for the various phases of the business, after deducting all direct overhead costs, is all-important. Inasmuch as these administrative expenses cannot be controlled by the divisions, no good purpose is seen in deducting them from division results. For control purposes, responsibility lines are regarded as offering the best method of control over expenses.

***A Dairy and Poultry Processor***

In a dairy and poultry processing company which has plants which mainly prepare products and sales branches which handle most of the sales, the home office expenses are segregated as between those related to the production end of the business and those related to the sales organization. Expenses relative to production are allocated to the processing plants on the basis of the relative number of pounds of product produced. The problem in making this apportionment has been the difficulty of converting to pounds products not normally measured in pounds. A dozen eggs, for instance, represents how many pounds? The company solves this by determining the approximate relationship of the sales value of a dozen eggs to a pound of poultry and using that relationship

to determine weight of eggs. The allocation of sales administrative expense to sales units is made on a basis of sales to outsiders.

### Conclusion Suggested

What conclusions flow from this review of administrative expense allocation as applied by these companies? There are several which the instances suggest. In the first place, any expense which can be definitely said to be attributable to a given operating unit should be charged to the specific operating unit before making any general allocation. The dairy company, for example, went to the extreme of finding out how much each branch was making use of the tabulating equipment, by keeping a count of the cards processed for each branch. Examples of other items which might be charged directly to locations are: mimeographed material for a branch, legal fees on a specific case affecting one branch, telephone calls to a branch, engineering services for the branch, etc. More could be identified in any particular company.

A second conclusion might be that a specific reason should exist if distribution of administrative expenses is to be considered a necessity. For example, the automotive parts wholesaler who wanted to pay bonuses on a net profit basis, found it necessary to use some method to distribute all costs to locations. On the other hand, the bakery was convinced that the contribution margin produced by each unit was the important factor and the administrative expenses were merely to be considered in relation to the total contribution margin from all operations. It may also be concluded that once allocation is considered a necessity, the allocation should be based on the benefit that the branch is drawing from the overall services. However, a basis which has price level as a factor introduces a distortion. The meat packer no longer uses the book value of its fixed assets as a basis for distribution because a changing price level has distorted the basis. The broadcasting company used time expended as a basis for allocation, which ties right into the relative benefits received by the company unit receiving the charge.

Practice, as exemplified in the instances reviewed, also suggests that expenses may be grouped as applicable to two or more types of general service areas. Then each group of expenses may be allocated to the locations which benefit from the services. The dairy and poultry processor first determined which expenses were related to processing and which to sales. Thereafter, each "pot" or group of expenses was distributed to the locations on different bases.

A final point apparent from the illustrations is that the allocation may be based on current month information, as a sales allocation would be, but that, in instances in which a quick closing is necessary, the basis may be that of prior history.

# How We Take Purchase-Related Costs to Products

by ELMO MURRELL

Cost Manager, United States Rubber Company, Fort Wayne, Indiana

*The proper charging of a product or commodity for its fair share of the costs of service departments is extremely complex in a multi-commodity plant when a standard cost system is used. Equitable distributions to prevent one commodity from subsidizing another is an objective of the cost department of the plant serving as background here. One facet of the service department cost allocation problem is illustrated in this article by material applicable to the purchasing, receiving and storing department.*

WE HAVE a common millroom for mixing rubber into finished recipes then delivered to processing departments of ten different commodities. Also, each of these commodity departments has material delivered directly to it other than rubber. This material, likewise, may be common to several of them.

Our main problem in cost allocation was to carry the costs of the three departments, namely, purchasing, receiving and storing, to the consuming commodities on an equitable basis.

These costs are divided into two parts:

1. Cost for purchasing, receiving, and storing materials consumed in common millroom.
2. Cost for purchasing, receiving and storing materials consumed directly by the end commodity.

The latter portion, under careful analysis, is allocated to the end commodity directly. The former, pertaining to the millroom, is prorated to the various commodities on the basis of pounds of material delivered from the common millroom to the commodities. This amount is then combined with the specific purchasing, receiving, and storing costs to arrive at the total cost for that particular commodity in the month.

As time went on, we found we could incorporate this approach in our standard costs in terms of a burden rate. The procedure for developing the standard allowance for the purchasing, receiving, and storing costs is as follows.

At the first of each year, we compute a standard cost per pound for the millroom element and a standard cost per pound for the specific commodity purchasing, receiving and storing cost. This is used, each month, to arrive at the standard cost of the total purchasing, receiving, and storing element for the purpose of calculating the standard cost of the material transferred from work in process to finished goods. How the result is placed upon the closing entry will be observable from the following:

| | | |
|---|---|---|
| Material | $50.00 | Credit material process |
| Labor | 15.00 | Credit labor process |
| Burden | 20.00 | Credit burden process |
| Total | $85.00 | |
| Purchase, receiving and storing | 5.00 | Credit special element of cost |
| Grand total | $90.00 | Debit finished goods |

As can be seen, purchasing, receiving and storing as a special element of cost, is not used as a process inventory account and, each month, the difference between the actual cost of purchasing, receiving and storing for the commodity and the standard cost is treated as a variation or penalty in that month.

### Basic Time, Space, and Service Allocations to Products

Hours reported by the individuals in the purchasing department as applicable to commodities or classification of product as established by the accounting division form the starting point of purchase cost assignment to products. By grouping the ordering and buying of materials by like items, this distribution is condensed considerably, without impairing substantial accuracy. Expeditors in the purchasing department allocate their time by product or commodity on the basis of hours service rendered. However, travel expense is charged, where possible, specifically to the applicable commodity. In the event travel expense cannot be identified by commodity, then this element is prorated on the same basis as other elements of expense in the purchasing department. For our purpose, we have set up the following classifications of service of the purchasing department:

1. Metal ordering by commodity.
2. Other specific material ordering, by commodity, except for the millroom rubber and chemicals which are not reported by commodity at this point but in total.
3. Ordering of specific departmental supplies reported against that specific department, e.g., maintenance materials.
4. Administrative costs, such as the purchasing agent, stenographer, etc., prorated on the basis of the services of the other employees in the department.

For the receiving element of cost, we use three basic distributions of cost as among commodities:

1. Wage dollars.
2. Floor area occupied.
3. Tonnage.

Our receiving department is paid on an incentive system of weights by the various classifications of product or commodities, depending upon the work involved in receiving the material. Elements of receiving cost included in the distribution to products on a wage basis are salaries, wages, payroll provisions or employee benefits, and prorated distributions to the receiving department such as the accounting costs, industrial relations cost, employment costs, and other overhead which varies as to hours of work or number of people. The floor area distribution is based upon floor space occupied by

product or commodity and the elements of receiving cost charged on this basis includes elements which normally fall under rent, such as building expense, janitor service, heat, light and plant protection. The tonnage received distribution basis applies to elements of cost which vary with tonnage, such as depreciation on machinery and equipment of the receiving department, repairs and maintenance and other charges connected with such equipment. These three distributions are then totaled to arrive at the total receiving cost by product or commodity for the accounting period.

The stores element of commodity cost is prorated in two distributions:

1. Service rendered.
2. Floor space occupied.

Due to the size of the storage area, the floor area distribution is an important allocation to product or commodity. Periodic checks are made by the accounting division and the stores department to see that the proper allocation is being made by product or commodity. Layout charts are kept up to date at all times to insure an equitable distribution. The charges prorated in this floor area distribution of the stores element of cost are the ones similarly charged for receiving as outlined above. All other costs of the stores function are prorated on hours of service rendered, by product or commodity. This is reported to the accounting division by the stores department foreman.

### *Standard Costing of Purchasing, Receiving, and Storing*

As has been outlined, we include purchase-related costs in our standard costs by part on a weight basis. At the first of each year, when we establish our standard rate for purchasing, receiving and storing, we apply this cost to each product in order to arrive at a total standard cost to be used for the calculation of our finished goods inventory and standard cost of sales. This standard, combined with our material, labor and burden, is known as the original standard and does not change during the year for finished goods and standard cost of sales calculations. At the end of each month, when the standard cost of production is calculated, the units produced for the month times the standard rate for the purchasing, receiving and storing element is the standard purchase-related cost for the month.

In this manner, we control these significant portions of production costs and compare the costs incurred for each month against the standard as established at the first of the year. Any large variance is checked immediately by retracing the distribution.

# Letters to the Editor

## WHAT MAKES A GOOD ACCOUNTANT?

*Editor, N.A.C.A. Bulletin:*

LET US TAKE A LOOK at the accountant of today, his responsibilities in the functioning of the organization, and the role that he plays in modern-day business. Probably no other function in an entire business organization has been so drastically affected by the increased proportions and complexity of modern business and the accompanying mass of governmental regulations and controls, as has accounting. Most accountants recognize the fact that accounting has advanced beyond the record-keeping function but have not kept pace with the needs of modern business. Well, then, what *are* the requisites of a good accountant?

The accountant's work is inter-related with that of sales, production, planning, engineering, advertising, maintenance, personnel, and any other functions necessary to the conduct of the business. Because of this close relationship, he must have some knowledge of these other operations and the many problems which arise from them. In addition to knowledge of the business, he must have a very specialized knowledge in the fields of taxation, law, and insurance. In practically every action that he takes, the accountant must be aware of the implications created by the Internal Revenue Code, which is, however, only one of a great many governmental regulations affecting him. His work and his decisions must be influenced, too, by the renegotiation act, workmen's compensation acts of the states, the Federal wage and hour law, the social security act, and many others. Too, he must be guided by state and local regulatory provisions which affect the record-keeping function of the business. He must be familiar with commercial law.

Nevertheless, in my opinion, the prime requisite of a good accountant is leadership ability. He must possess the qualifications to be or become a part of the top management team—to effectively coordinate and control the use of men, money, machines, and material. If he cannot deal effectively with people, certainly all of the technical knowledge and ability he possesses will be utterly wasted. He may be a genius when it comes to sales forecasting, distribution costs, pricing, process costs, standard costs, budgeting, inventories, taxes, and all other phases of accounting but, if he has no ability to understand and deal with people, certainly he is not capable of being a member of the management team. All of the records, the ideas, the reports, and the actions taken by the accountant are based upon information furnished him by the people within the organization who are responsible for its various diversified functions. Without this information, there can be no accounting function. To get this information, the accountant must be able to communicate with people. To make it useful requires the same faculty in relationship to the various department heads and to top management. He must work closely with all of these people. When the accountant has learned to perform this function adequately, he can then begin to perform as a salesman. In most instances, this is probably his second most important function. He must make top management aware of the services that he has to offer.

I do not mean to say that a full knowledge of accounting techniques is not important. It would be ridiculous to argue that technical skill is not necessary to the performance of the duties of an accountant. I do believe, however, that we should spend

more time and effort in developing our knowledge and understanding of human beings. The accountant must aggressively try to understand all of his fellow workers as well as the jobs that they perform, and he must attempt to give to all a clear knowledge and understanding of what he is attempting to do and why he is doing it.

VERNON E. ZUMHAGEN

## THE ACCOUNTANT IN BUDGET ADMINISTRATION

*Editor, N.A.C.A. Bulletin:*

EFFECTIVE BUDGET administration embraces a comprehensive knowledge of the viewpoint, polices and fundamental functions of all levels of management activity. The factory foreman must be indoctrinated with the firm conviction and understanding that he is management in his own area. This is also applicable to the office supervisor, the traffic manager, the warehouse superintendent and all other members of the managerial team.

The budget accountant, therefore, to be competent and effective in the performance of his function, must understand the objectives, the policies, the personal thought approach of each of the levels of management. He must be favored by top management with its confidence and trust as to long-range plans, decisions, and administrative policies and he must be able to interpret these considerations (often highly confidential) into the components and data releases incorporated into the budget plan.

Constant consultation with the supervisors at all levels must be a part of the administration of budget plan. The budget accountant cannot know how to operate every machine, to grind tools, to repair trucks, nor to perform all the required quality checks of inspection. He can, and must, however, have a competent understanding of current, past, and anticipated problems and functioning of the respective operational phases of the business and the departments comprising them. He cannot otherwise guide the control action of the respective members of the team to effective results.

Then there is the reporting side, to enable line management to effect control. Too often, reporting media are cluttered up with useless data. The factory foreman can do little or nothing about operational costs derived from tax assessments, building depreciation, and similar cost types. The accountant must confine his presentation to the pertinent needs of the operation being reported. What then are the most important considerations in developing a reporting media:

1. Accurate and prompt compilation of data.
2. Classification and summarization of data to provide for current reporting.
3. Reporting actual against budget in a clear and effective manner.
4. Intelligent notes and comments to make statistics indicative of trends and explain deviations.
5. Effective timing of reports.
6. Effective circularization of reports.
7. Imparting of complete understanding to the report recipient as to the utility and limitation of the reports and as to the auxiliary data available and how to get it.
8. Novelty in presentation. Pictorial, graphic, and unusual presentations of statistics are particularly effective.

There is much, too, that the accountant can do to aid budget administration beyond this point. However, he will not get far if he has not followed effective practice in budget preparation and reporting.

GORDON A. PARENT

# Notes on Current Reading

## Books

**Readings in Cost Accounting, Budgeting and Control.**

*William E. Thomas, Jr., Editor, Sponsored by American Accounting Association, South-Western Publishing Co., Inc., 5101 Madison Road, Cincinnati 27, Ohio, 1955, 785 pp., $6.50.*

A substantial part is played in this book by N.A.C.A. authors and by N.A.C.A. as an Association, as evidenced by inclusion of *Bulletin* articles and N.A.C.A. research studies among the approximately 60 papers of which the readings are made up. Other periodical sources are also availed of. The entirety was assembled, as indicated in the text, to make it easier for instructors to refer students to helpful beyond-textbook readings. It constitutes for all readers a classified symposium of papers published in recent years in central areas of cost accounting.

**Corporation Accounts and Statements — An Advanced Course.**

*William A. Paton and William A. Paton, Jr., The Macmillan Company, N. Y., 1955, 740 pp., $6.75.*

In the financial accounting area, this book is concerned, in an ultimate sense, with what corporate reports do and can reveal. It is commented prefatorily by the authors that "it would not have been altogether inappropriate to have adopted the title, 'Equity Accounting' . . . as the emphasis is on the array of problems having to do with the rights of common stockholders, senior investors and other interested parties." Few balance sheet items or kinds of corporate reports (including consolidated statements) fail of intensive treatment. Analysis by ratios is also covered.

**Accounting for Parishes.**

*Godfrey F. Burkhardt, The Archabbey Press, Saint Vincent Archabbey, Latrobe, Pa. 1954, 182 pp., $3.00.*

Both elementary and detailed—and illustrated by forms—this presentation is something of a textbook and a manual as well. It is written for the assistance of pastors. First prepared in 1949 for use in courses at the author's seminary (Saint Vincent College), it was published for use elsewhere in introducing "the seminarian to those fundamentals of accounting, finance, and management which will be useful in the administration of a parish plant."

**Introduction to Business.**

*Raymond E. Glos and Harold A. Baker, South-Western Publishing Co., Inc., 5101 Madison Road, Cincinnati 27, Ohio, Third Edition, 1955, 692 pp., $5.50.*

The subtitle of this work is "a textbook for the first course in business on the collegiate level." The goal of the present edition, as of previous ones, appears to be to cover the features of business activity, its economic setting, and its vocabulary as attractively and adequately as possible, to the beginning student. The part captions, in order, are: ownership and organization, physical factors, personnel, marketing, finance, managerial controls (including, as chapters, accounting, budgets, and business statistics), regulation, and law and taxation.

**An Introduction to Automatic Computers — A Systems Approach for Business.**

*Ned Chapin, Illinois Institute of Technology, Chicago 16, Illinois, 1955, 245 pp., $9.00.*

Written with readability as one objective and clarity as another, this volume deals with the potential business uses of electronic equipment. Later chapters undertake a pretty thorough description of the equipment. Earlier ones "ease into" the whole subject in its important aspects under such chapter headings as "What Is an Automatic Computer?", "What Can An Automatic

## SELECTED ARTICLES FROM ACCOUNTING PERIODICALS

**THE ACCOUNTING REVIEW,** *October* **1955 (College of Commerce and Administration, c/o Carson Cox, Ohio State University, Columbus 10, Ohio, single copy $1.50)**

Conservation of Productive Capital Through Recognition of Current Cost of Depreciation. Paul Grady.

An Objective Look at Effects of Income Taxes on Financing Small Business. Roderick F. McDonald.

Joint Cost Analysis as an Aid to Management. Arthur N. Lorig.

Social Accounting. John P. Powelson.

Electronic Data Processor — A Milestone in Machine Method. Harry D. Kerrigan.

Construction of Present Value Tables for Use in Evaluating Capital Investment Opportunities. Charles Christenson.

**ARTHUR ANDERSEN CHRONICLE,** *October* **1955 (120 South LaSalle Street, Chicago 3, Illinois)**

Operations Research — A Scientific Basis for Executive Action. R. Pat Crouch.

**CANADIAN CHARTERED ACCOUNTANT,** *October* **1955 (Chartered Accountants Building, 69 Bloor St. East, Toronto 5, Ontario, Canada, single copy $.50)**

Accounting for Life Insurance Companies. M. E. Bradshaw.

**THE CONTROLLER,** *October* **1955 (2 Park Avenue, New York 16, N. Y., single copy $.50)**

Recent Developments in Accounting for Reserves. Walter G. Kell.

Controllership — Key to Efficiency in Government. Dudley E. Browne.

*Projecting the Profitability of New Products. T. T. Miller.

**COST AND MANAGEMENT,** *September* **1955 (31 Walnut Street South, Hamilton, Ontario, Canada, single copy $.50)**

Marketing Cost Control. Paul Jeffrey.

Developments in Electronic Data Processing Machines. M. J. Fraser.

The Human Relations Aspect of Financial Controls. J. A. McIntyre.

**JOURNAL OF ACCOUNTANCY,** *October* **1955 (270 Madison Avenue, New York 16, N. Y., single copy $.75)**

*A Look at the New Look in Federal Taxation. Paul K. Webster.

**THE NEW YORK CERTIFIED PUBLIC ACCOUNTANT,** *October* **1955 (677 Fifth Avenue, New York 22, N. Y., single copy $.50)**

The Application and Use of Machines and Electronics in Accounting. Kermit M. Pennington.

**RETAIL CONTROL,** *September* **1955 (100 West 31st Street, New York 1, N. Y., single copy $.75)**

Sales Forecasting. Abe Hackman.

Use of Breakeven for Profit Planning. Harry W. Krotz.

*Further mentioned in accompanying notes on particular articles.

Computer Do?", "Business Systems for Automatic Computers," and "Cost Aspects of Automatic Computers." These and other chapter titles get down to text through useful subheadings identifying the material treated.

**What Is Operations Research Accomplishing in Industry?**

*Operations Research Group, Engineering Administration Department, Case Institute of Technology, Cleveland, Ohio, paper bound, April 1955, 102 pp., $5.00.*

Numerous applications of operations re-

search are supplied in the fifteen papers making up this volume (which reports conference proceedings at Case Institute last April), many of them dealing with problems which accountants either frequently assist in solving or by the solution of which they are in a measure affected. Operations research in the "allocation of sales effort," "research on industrial consumers," "production scheduling and inventory control," and "warehousing and distribution" are examples.

**The Businessman's Guide to Government Information and Advice.**

*Edited by Sherman S. Cohen, American Association for Public Information, Education and Research, Washington 5, D. C. 1955, paper bound, 99 pp.*

Following introductory comments forming Part 1, the body of this large-size pamphlet style handbook in Part 2 and 3, respectively, supplies a 17-page "selected bibliography of government publications" and a larger "directory of Federal statistical personnel." The bibliography is classified, e.g., "government procurement," "small business management" and is also annotated as to each item listed. An example is the Federal budget described as containing "the budget statements, estimates of appropriations, estimates of revenues and receipts, and comparative titles" and available from the Bureau of the Budget.

## *Articles*

**Accurate Inventory Measurement.**

*Robert L. VanDeMark, Advanced Management, October 1955.*

There are three equations (for commitments, stores, and in-process) presented in this article to develop "multipliers" for calculation of inventory levels. However, the approach taken by the paper is not abruptly mathematical but passes first through explanatory material identifying "basic inventory divisions," "lead time significance," "calculation of reserves," and "inventory goals," to arrive at the point—"we want to develop a formula for each . . . inventory division"—where calculation is called for.

**Projecting the Profitability of New Products.**

*T. T. Miller, The Controller, October 1955.*

In the author's company, the sense of the title of this article is given form in evaluation of five factors (each covering a group of subfactors) related to the prospects of a new product. As indicated in text and tables in the paper, the factors are stability, growth, marketability, financial considerations, and product position in company operations. The gradations in which each of these factors and its related subfactors is evaluated are five in number and run from "very good" down to "very poor."

**A New Look in Federal Taxation.**

*Paul K. Webster, Journal of Accountancy, October 1955.*

Neither an accounting article nor an article on tax law or cases, this compact paper by an Assistant Commissioner of Internal Revenue describes the organization and work of the Internal Revenue Service as now constituted and includes an illustrative organization chart and a map. Processing of returns, their selection for verification, the case backlog, new policies, etc., are discussed briefly. The author sees the "beginning" of the "emergence of a more efficient . . . Service."

# For Your Information

## Parts of Accounting — and the Whole

IT IS PROBABLE that a profession benefits as the specialties within it are recognized and each becomes the specific interest of a segment of practitioners. It is also probable that members of a profession in any specialty or broader area of a profession benefit when the bounds of the profession as a whole move outward and embrace new territory. It has been that way with accounting. When to external auditing was added general and financial accounting, and when internal auditing and methods work became a part of the scheme of things, the field of accounting achieved increased recognition. When, incorporating some portions of other specialties, industrial accounting came solidly into the picture and, with assists from engineering, developed standard costing, budgeting, and other management aids, to maturity, there was no accountant in any area who did not thereby become the member of an enriched profession.

The process is still going on. (It should be mentioned that the stature of accounting is enhanced not only by increased areas of application but also by increased usefulness in each area of application.) Of recent years, internal accounting in the Federal government has developed markedly, as successive reports of the "Joint Program to Improve Accounting in the Federal Government" indicate, and accounting employees of the Federal government have formed themselves into an association in awareness of possibilities in the field. Together with some signs of like activity in state and municipal governments and in institutional enterprises, this may be taken as a strong suggestion that the tools of accounting have potentials to aid in better management and improved reporting in this extensive area, just as in the world of business.

On a different level, economists and accountants have been busy with the idea that the structure of accounts will ultimately enable technicians, whether accountants or economists, to put the commercial transactions which take place in a nation or geographical or other section of it, into useful statement form. This ambitious and still experimental objective also, if attempts to implement it do not outpace the development of practical procedures to recognize the realities of national economic situations, may also be readily noted as attaching greater standing in modern society to the central ideas and techniques upon which accounting is based and which it utilizes in all its applications.

## Another Area to be Opened Up?

The foregoing comments stressing the obvious (lest it not come to attention as such) for the interest of industrial accountants, whose own area is broad, is preliminary to calling similar attention to another area, intimate to most individuals whether or not accountants, in which some sort of record-keeping is ordinarily but sketchily applied. This is the area of individual or family financial management or accounting. The wide application of the income tax in recent years has brought most family units to the threshold, at least, of record-keeping. There are an increasing number of advisory publications in this area. But does accounting, as a means, have anything to say to the family? Should it prove to (although nothing in these comments will attempt proof or other logical process except interested observation), it will be natural to find accountants who are engaged in other areas stimulated and perhaps intrigued by this development.

It is perhaps well to say that attention to

family accounting, though directed with definiteness, is not here drawn with any great boldness, despite a few existing articles on the subject. The points to be made note of below were found in a tentative manuscript draft not tested by many readings. (Not a manuscript submitted in Chapter Competition.) They are reflected here because, to the extent valid, they do imply that family units may adapt and use accounting and related techniques in ways which, as a primary objective, would be helpful to the stability of these units and, as a consequence, to the stability of the economy which they comprise.

### Life-time Projections

The draft referred to was planned by its author to introduce a case study illustrative of the viewpoint taken. This viewpoint, in brief, is that the economic life of a family can and should be planned—not with one plan but with alternative plans, not against circumstances but in line with them, and not with finality at a point in time but tentatively at all times throughout the period of the family's existence as an income unit.

Such planning is represented as even more reasonable for a family than a company, for the family has a sequence of known tasks to accomplish over a known period of time. The author identifies individuals, couples, and families with children as family units and would give first attention to the family conceived of as a couple who have the responsibility of rearing two to four children and providing for their own retirement. He regards the normal term of existence of this unit as forty earnings years and ten post-earnings years, as follows:

| Age of parents | Stage | Length |
|---|---|---|
| 25-27 | Marriage to birth of first child | 2 years |
| 27-55 | To maturity of children | 28 years |
| 55-65 | To retirement | 10 years |
| 65-75 | Post-earnings years | 10 years |
| | | 50 years |

The foregoing idea is elaborated into the thesis that a man can forecast his future income on several bases for a longer period and more usefully than a corporation, having regard for the conditions of his line of work, health, training, aptitude, and contacts, and that he can try out several life-time curves of possible results, which will help him decide what scale of living he and his family can enjoy, and at what times, under each income hypotheses. He can estimate the income effect of unemployment, illness, change in work, establishment of a business, the participation by his wife in gainful employment, or the contribution of earnings by minor children. It is conceded that it will make a great deal of difference what the man's principal source of earnings is likely to be—whether from union scale wage, professional salary, business profits, etc.—but it is contended that intelligent projections constructed and maintained will shed an appreciable degree of light far ahead.

The correlation of costs (living expenses) to these income prospects is presented as a much more worthwhile process, even if more exacting, than the casual, short-term fixed estimates of expenses commonly relied upon to allocate income to need. The looking ahead process is to take account of several conditions portrayed as

obvious if faced—but not always faced or, at least, not squarely. Among these are the circumstance that increase in the size of a family, in the consumption rate and needs of the children, and possibly in the medical care required by adults, together with long-term inflation, form a four-way pressure which calls for some increase of money income over the whole earnings period just to maintain the starting living standard. (Families usually assume their only material task is to better that standard.) Another point made with respect to costs is that one constant feature of a family's economic career is a series of special financial requirements — furnishing the first home, medical and other expenses of the arrival of children, securing a permanent home, expanding outlay for such protection items as an insurance program, providing for education of the children, and arranging for security in post-earnings years. It is suggested that, although vaguely regarded as sporadic over the years, these needs meet end-to-end or even overlap and that, if not flexibly planned against income, they combine with true emergencies like illness or a break in employment, to create confusion and helplessness.

### Suggestions Made as to Accounting Tools

The draft here digested in part, makes no pretense of doing more than point the way. However, this includes a concrete form for a plan which will be subject to continuous up-dating will relate the incidence of projected income and expense, thus permitting efforts to adjust both. The form suggested may be embodied in a schedule (preferably prepared for the entire forty years, to consolidate objectives, but with progressively less detail) of which the following are the headings for the first two five-year period. (It is also suggested that the earlier portion of the period may be represented by one-year columns):

| | Years 1-5 | | Years 6-10 | |
|---|---|---|---|---|
| | Mother | Age 25-30 | Mother | Age 30-35 |
| Family → | Father | 27-32 | Father | 32-37 |
| | Child A | to 3 | Child A | 3-8 etc. |
| ▼ Captions | Child B | to 1 | Child B | 1-6 |
| | | | Child C | to 3 |
| Income (Several lines representing as many possibilities) | | (Round figures) | | |
| Expense (Detailed under categories as "short-term necessities" "long-term necessities" "protection, etc.) | | (Round figures) | | |

The foregoing is offered in the draft manuscript for its basic significance only, with the comment that whatever is developed should symbolize alert planning and be a point of departure for changes in plan. The paper also deals, although no more definitely, with the problem of using the plan in the short-term (necessary if it is to have real meaning) and suggests a running 90-day budget schedule related to checkbook transactions—with one month dropped as another is added—to provide the day-to-day operating link with the long-term plan then in effect.

### An Aid to (Family) Management?

It is readily imagined that, if a family were to undertake the suggested endeavors wholeheartedly and on an informed basis, time relationships of income and expense might conceivably be bettered, alternative avenues to income better appraised, and costs modified, forsworn or better prepared for. In these connections, the draft and notes under discussion recognize several types of economy, in order more effectively to pave the way for use of planning tools. These are:

1. Price economy (buy cheapest)
2. Quality economy (buy to last, etc.)
3. Home-work economy (make instead of buy)
4. Preservation economy (protective discipline)
5. "Do-without" economy
6. Equipment economy (requiring capital outlay)

One other tool suggested is a value-equivalents schedule to counter "price blindness." Families would construct this for their own situations, e.g., how many trips to the circus equals a living room rug equals a satisfactory gift to the heart fund equals an encyclopedia equals a food bill for what period? The author deals with the thought that the price system already supplies this information, by contending that price information is often not used effectively for comparison of cost widely separated in kind but rather just to price different grades or makes of the same article, e.g., autos, radios.

### An Application of Accounting Techniques

In short, there are conjured up some of the elements of an accounting structure which would serve families for both financial planning and performance budgeting. Many questions as to implementation are left unanswered but the prospect raised is one of high and widespread usefulness of known accounting techniques in yet another field beyond those in which they are commonly applied at present. Such a development would be likely to be heartening to all accountants, just as advances of applications in fields of medicine, engineering, teaching, or law are heartening in those fields.

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